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An Independent Assessment of the Physiological and Cognitive Effects from the X-26 TASER® Device in Volunteer Human Subjects

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14. ABSTRACT

Exposure to the X-26 TASER? was studied in 32 healthy human subjects (police academy cadets who previously volunteered for X-26 TASER? exposure as part of their training). Five primary data sets were obtained: (1) blood analysis before, immediately after, and 24 hours after exposure, (2) 12-lead electrocardiogram (ECG) recordings before and after exposure, (3) respiratory function testing before, during, and after exposure, (4) psychomotor function task assessment prior to (audio stimulus) and during exposure, and (5) post-exposure interview. The data analysis of (3) is technically limited because of low confidence in the data. Hence, this report focuses on the blood chemistry analysis, ECG evaluation, psychomotor function assessment, and post-exposure interview findings.

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Brief Summary of Results of this Investigation

A total of 32 police academy cadet volunteers were exposed to the X-26 TASER® stimulus for 5 second (one trigger pull) as part of their training, and with consent they were monitored before, during, immediately after, and the day after as part of this study. This study was conducted according to an active protocol that was approved by the IRB of The Texas A&M University System. Although the subjects reported the sensation of intense pain during the exposure, the pain ceased with cessation of the stimulus, and markers of tissue injury were normal after exposure. With 90% or greater confidence, all but two serum marker of physiological function had null-to-insignificant changes from pre-exposure baseline. Cortisol increased by 1 standard deviation and lactate increased by 2 standard deviations in the serum samples taken just after X-26 TASER® exposure. For all the serum markers in the samples taken the day after, changes were null-to-insignificant. Increases in lactate are consistent with the intense muscular co-contractions during stimulus with potentially reduced respiratory function during stimulus—i.e., an oxygen debt post exposure was expected. Increases in cortisol are consistent with the hormonal response to a highly painful stimulus. Comparison of 12 lead ECG recordings before and after X-26 TASER® exposure was notable for emergence (observed post-exposure but absent pre-exposure) of: sinus tachycardia in 4 subjects, sinus arrhythmia in 3 subjects, atrial premature contractions in 1 subject, and non-specific ST and/or T wave abnormalities in 2 subjects. Similar abnormalities were also observed in some pre-exposure ECGs. Such changes are consistent with increased adrenergic state—a likely consequence of X-26 TASER® exposure; however, they could be associated with direct electrical effects of X-26 TASER® exposure on the heart. Cardiac enzymes did not increase significantly 24 hours later so myocardial damage in unlikely. Performance of the button press test indicated that subject response was critically reduced during X-26 TASER® stimulus; however, subject response became normalized immediately after cessation of the X-26 TASER® stimulus. During X-26 TASER® exposure only 2 subjects were able to press the button with obviously impeded movements—and both had significantly delayed response times (2.56 sec and 4.59 sec) relative to the average response time, 0.98 sec, of the control set (button press delay measured from start of audio stimulus to button press). If unable to press the button during X-26 TASER® exposure, subjects were instructed to press the button immediately after the end of exposure. The average response time immediately after exposure was 1.14 sec which is not significantly different to that of the audio stimulus control set. Respiration rate, flow, and gas concentrations were measured before, during, and after X-26 TASER® stimulus; however, confidence in the data is very low because synchronization of measurements with X-26 TASER® stimulus was not achieved, subject positioning caused significant data dropout, and X-26 TASER® stimulus (5 sec) is on the same order of the period of the respiratory cycle.

Table of Contents

Introduction

Background

Law enforcement agencies have deployed batons, sprays, conducted electrical weapons and firearms as a means of self-defense and to facilitate restraint and control of aggressive subjects. The X-26 TASER® (TASER International, Scottsdale, AZ) is a battery-operated electrical incapacitation device that issues pulses of current through two barbed electrodes connected to the weapon by insulated copper wires. Integrated laser sight allows the probes to be fired up to 35 feet away, attaching directly to a subject's skin or indirectly to clothing (pulses can traverse up to two inches of clothing). Once the device is triggered, exposure is delivered for 5 seconds, causing incontrollable muscle contraction and pain that typically renders its target immobilized. The original TASER® weapon operated at 7 watts but was eventually termed ineffective after finding that motivated subjects were able to overcome its incapacitation effects. Since then, more powerful configurations have been developed, the latest of which is the X-26 TASER® (26 watt system). The bioeffects of the X-26 TASER® have not yet been studied extensively in humans and the Department of Defense has expressed the need for a rigorous empirical analysis of the associated effects in order to continue with deployment.[1, 2] Advocacy groups have further emphasized the need for unbiased research by an institution that maintains no affiliation with the manufacturer (TASER International).

Goals of this Investigation

This study is meant to fulfill the need for an independent observational assessment of effects of the X-26 TASER® on humans. In particular, physiological effects (via measurement of markers of cardio-respiratory function and tissue damage) and incapacitation effects (via measurement of ability to perform a button press test) were sought.

Hypotheses to be Tested

This study was designed to test the following null hypotheses (H_o):

1.) X-26 TASER® exposure will not significantly alter volunteer participants' respiration.
2.) X-26 TASER® exposure will not significantly alter volunteer participants' cardiac function.
3.) X-26 TASER® exposure will not significantly alter (does not raise) volunteer participants' serotonin levels that could induce Serotonin Syndrome.

Exposure to the X-26 TASER® was studied in 32 healthy human subjects (police academy cadets who previously volunteered for X-26 TASER® exposure as part of their training). Based on the original study's design for statistical significance, 32 subjects is roughly half—an ideal breakpoint for data analysis and study assessment. Five primary data sets were obtained: (1) blood analysis before, immediately after, and 24 hours after exposure, (2) 12-lead electrocardiogram (ECG) recordings before and after exposure, (3) respiratory function testing before, during, and after exposure, (4) psychomotor detonation task assessment prior to (audio stimulus) and during exposure, and (5) post-exposure interview. The data analysis of (3) is technically limited because of low confidence in the data (discussed later). Hence, this report focuses on the blood chemistry analysis (Table 1), ECG evaluation (Table 2), psychomotor function assessment (Figures 2 and 3), and post-exposure interview findings (Table 3).

Methods

Study Design

This was an independent and prospective study of the bioeffects of X-26 TASER® exposure in human subjects. Participants were recruited from the Austin Police Academy in June-July 2008 amongst those cadets that had previously volunteered to undergo X-26 TASER® exposure. The analysis was conducted for the Joint Non-Lethal Weapons Program by The Texas Engineering Extension Service and The Texas Engineering Experiment Station (Department of Biomedical Engineering) both within the Texas A&M University System. X-26 TASER® exposure was issued by Austin Police Academy staff as per their normal training methods. The study was approved by the institutional review board at Texas A&M University. Consent forms were obtained from all subjects before inclusion in this study.

X-26 TASER® Application

Application consisted of manually applying electrodes (alligator clips connected to an X-26 TASER® device) on the shoulder (clamped to shirt in the mid-scapula region of right shoulder) and waist (clamped to upper edge of pants mid-way from spine to right margin) of the subject while he or she was lying on a padded mat in the prone position with hands at their sides. Electrodes were applied manually to ensure consistency of lead placement throughout data collection. The X-26 TASER® was triggered by an instructor from a distance of approximately 7 feet away. Electrical delivery lasted for a standard 5-second duration (one pull of the trigger), as used in training and as in the field. A button press task to simulate an improvised explosive device (9 volt switchbox) was placed directly in front of the subjects (in direct sight). Subjects were allowed to position the button apparatus to make it comfortable to reach and press.

Study Protocol

Measurements taken before the 5-second X-26 TASER® application include a 20 cc venous blood sample, a standard clinical 12-lead electrocardiogram recording, and respiratory data collection for baseline values of electrolyte and serum markers and cardio-respiratory function. All phlebotomies were performed by certified emergency medical technicians using routine venipuncture practices, wherein a sterilized intravenous catheter was placed in the vein of the anterior forearm for ease and repeatability. Respiration was measured non-invasively using a MedGraphics CPX Ultima System (Med Graphics, St. Paul, MN). Oxygen saturation and pulse rate were also measured with a finger pulse oximeter (on the middle finger of the non-dominant hand).

A pre-exposure button-press task was issued (in 7 subjects) wherein subjects were instructed to trigger the simulated improvised explosive device (switchbox) upon hearing an audio stimulus to establish a baseline of response times. Figure 2 (a) denotes the average baseline time delay to trigger the switchbox. Subjects were next instructed to press the button immediately upon the initiation of a 5-second X-26 TASER® application. A virtual instrument created in LabVIEW (National Instruments Corp., Austin, TX) collected data indicating the response time from stimulus onset to task completion. A custom circuit delivered the audio stimulus and a trigger to the data acquisition board. The X-26 TASER® stimulus was evident on the ECG signal and collected on the data acquisition board; execution of the button-press task opened a 9 volt battery

circuit connected to the data acquisition board to record the button-press event relative to the X-26 TASER® stimulus or audio stimulus. Respiratory rate, tidal volume, oxygen and carbon dioxide concentrations, and heart rate were measured throughout X-26 TASER® exposure.

Approximately one minute following task completion, a secondary 12-lead electrocardiogram recording was performed. Respiration, blood oxygen and heart rate were measured with the subject remaining lying down. Immediately upon removing all electrodes and equipment from the subject, a secondary blood draw was performed. A semi-structured interview was then administered to obtain pilot data on subjects' mental capabilities. A third blood sample was acquired the following day when subjects were able to break from normal academy training. Thus, the third venous blood sample was not drawn precisely 24 hours later; rather, it was drawn the following day.

All drawn blood specimens were labeled, collected and transported to an off-site facility by an independent laboratory organization (Laboratory Corporation of America, Austin, TX) for standard electrolyte and serum analysis of a total of forty three serum variables. Levels of particular relevance to this investigation include C-reactive protein (cardiac), cardiac troponin I, creatine kinase, serotonin, serum potassium, serum myoglobin, lactic acid and cortisol. All electrocardiograms were sent to an independent cardiologist for a professional evaluation of changes in ECG features from before exposure to after exposure.

Data Analysis

All data were entered in a Microsoft Excel database for analysis. Descriptive statistics including mean, standard deviation, range, percent change and response time were determined to describe the data. The percent changes reported reflect changes from baseline values for each subject (values before X-26 TASER® exposure) with 95% confidence intervals. Those intervals crossing zero indicate an insignificant change in levels. Normal ranges for a given marker are ± 1 baseline standard deviation. An increase in post-exposure marker levels between one and two baseline standard deviations was termed borderline high; increases by more than two baseline standard deviations was termed abnormally high. A natural logarithmic transform was applied to three of 43 markers to reduce positive skew and improve normality: C-reactive protein cardiac, serotonin serum, and creatine kinase. Figure 1 displays a distribution of the data before and after applying a transformation. Secondary analyses of the blood serum and button press data was conducted by statistician Dr. May Boggess (Texas A&M University) for a power analysis and confirmation of statistical significance (Appendix A).

Results

A total of 32 subjects, 29 male and 3 female cadets, from the Austin Police Academy participated in the X-26 TASER® study. Subject ages ranged from 21 to 55 years. All further individual subject data has been de-identified.

Laboratory results of the standard blood serum marker analysis before and after X-26 TASER® application are provided in Table 1. C-reactive protein, serum myoglobin and serotonin levels remained at baseline levels post-exposure and 24 hours later. Troponin I values also remained at baseline (<0.2 ng/mL) post-exposure and at 24 hours. An increase in creatine kinase and serum potassium levels was noted at 24 hours. Cortisol levels increased significantly (between 1-2

baseline standard deviations) immediately following exposure but returned to baseline levels at 24 hours. Lactic acid values were the only clinically significant change observed (post-exposure) with an increase by more than 2 baseline standard deviations; levels returned to normal at 24 hours. Appendix A provides a summary of the deviations in marker levels from baseline post exposure and at 24 hours.

Two subjects' baseline electrocardiograms contained pathological findings (based on the observation of nonspecific intraventricular conduction delay and right ventricular hypertrophy). These two cases are independent of the X-26 TASER®—these abnormalities were present in baseline recordings prior to exposure. Four of the 32 electrocardiograms reflected significant changes from baseline to after X-26 TASER® exposure. The effect of five-second X-26 TASER® exposure on the cardiac conduction system for these four cases was further investigated by evaluating C-reactive protein levels (cardiac marker, 24-hours post-exposure). Cross-examination indicates these levels remain well within a normal range. No evidence of permanent pathological abnormalities resulting from exposure was found.

Table 2 summarizes the effects of X-26 TASER® exposure on 12 lead ECG recordings. Table 2 (a) lists abnormalities present in baseline ECGs only and serves to demonstrate the natural variation of the electrical recordings. Irregularities arising in post-exposure electrocardiogram recordings were all non-pathological and include sinus tachycardia, sinus arrhythmia, nonspecific ST and/or T wave abnormalities, and premature atrial complexes (PACs).

An analysis of the respiratory data obtained through the CPX Ultima System and finger pulse oximeter is permanently on hold due to low confidence in the data (equipment malfunction). The sensors within the mouthpieces inadvertently became degraded due to moisture accumulation as subjects were lying in a prone position. Most of the records are missing measurements as a result. X-26 TASER® application time was also not evident in the respiratory data record, and synchronization with the X-26 TASER® stimulus was not achieved. The first minute is certainly pre-exposure and the last minute is certainly post-exposure, but the precise onset and cessation of the stimulus in the record is unknown. Moreover, the CPX Ultima acquired measurements every five seconds, the exact duration of standard X-26 TASER® exposure; thus records of respiratory function during actual exposure are incomplete. Observation of the 32 subjects indicated that the chest wall and abdominal musculature is uncoordinated, making breathing difficult during exposure. Diaphragm and facial nerve (for larynx control) activity appear to be retained and was evidenced by audible utterances (such as emphatic expressions) in almost all subjects during X-26 TASER® application. Subjects also breathed heavier after exposure, but the increase appeared to be similar to that of going up a flight of stairs rather than strenuous physical exertion as after maximal cardiovascular exercise. If it is later determined that additional data points are needed to establish the respiratory effects of X-26 TASER® exposure, a further evaluation of the data collection equipment is needed.

Psychomotor function was evaluated by measuring the time elapsed between the onset of X-26 TASER® exposure and first switchbox trigger event. Response times to execute the button-press task are shown in Figure 2. Figure 2 (a) corresponds to the audio stimulus button-press response times (n=7); a reduced number but sufficient for characterizing the baseline response because of tight grouping of the data, and consultation with a statistician has confirmed that this data has

sufficient power to establish confidence. Mean baseline response time of the control set was 0.98 (±0.25) seconds. Figure 2 (b) depicts a distribution of the response times to execute the psychomotor task in the presence of the X-26 TASER® stimulus (n=30). Two subjects were excluded due to data acquisition failures. Mean response time with the X-26 TASER® exposure was 6.06 (±0.91) seconds; two subjects were able to execute the task during the exposure period; response times for these individuals were 2.56 seconds and 4.59 seconds. A comparison of the response times for these two groups is shown in Figure 2 (c). The average time taken to press the button after start of X-26 TASER® stimulus minus the average time taken to press the button after start of audio stimulus is 5.08 seconds which is roughly equal to the duration of TASER stimulus (5 sec).

Mean response time to execute the test once exposure ended was 1.14 (±0.85) seconds and is shown in Figure 3 (b) (n=30). The negative time delays correspond to the two subjects able to trigger the switchbox before the five-second application ended. Figure 3 (c) compares the data with baseline. The average difference in response time from baseline is 0.16 seconds. The ability to press the button after the X-26 TASER® stimulus ended is roughly the same as the ability to press the button after an audio stimulus.

The interviews conducted immediately following exposure contain information on the sensory and behavioral effects of X-26 TASER® exposure. Results are summarized in Table 3. Immobility and pain were the most common terms used to describe the sensation of exposure. Thoughts during exposure were primarily of the pain and tolerating the application, while those afterwards were of task completion and relief. Seventy five percent of subjects reported being conscious of their surroundings; 90.6% retained hearing capabilities and 81.3% maintained vision capabilities (five subjects closed their eyes during). A majority of subjects were able to hear commands given both during (90.6%) and after (96.9%) exposure. 71.9% of participants were unable to control their actions during X-26 TASER® exposure; 87.5% believed they would be unable to follow simple orders, had they been provided (e.g. raising arms). A reported 80.6% of subjects claimed to regain control within one second after exposure ceased.

45.2% of the study population asserted that exposure would render them incapable of concentrating on the execution of a hypothetical attack during exposure; 32.2% believed it would be possible provided with an external cue or prompt. One subject claimed to have control of his actions during exposure. Eight subjects reportedly retained partial control of their actions. Had they had been attacked by someone prior to X-26 TASER® application, 96.9% of participants believed they would fail in task execution.

Discussion

TASER® devices are nonlethal electrical incapacitation weapons employed by law enforcement agencies as a means to subdue aggressive individuals by disrupting motor and sensory function of the peripheral nervous system. The latest generation issued is the X-26 TASER® (TASER International, Scottsdale, AZ) and is the most powerful model yet, with total power output of 26 watts issued through 100 μs electrical current pulses (average 2.1 mA) over five seconds. Peak voltage delivered across the body is 1,200 V; the device is capable of reaching a maximum of 50,000 V to conduct electrical current through clothing. Previous studies of the X-26 TASER® in humans have failed to detect clinically significant changes in ventilation, electrolyte and

serum markers indicative of kidney, liver and cardiac function, or cardiac electrical activity upon a standard five-second application.[1,2]

Application of the X-26 TASER® causes obvious excitation of multiple muscle groups (observed) and pain fibers (all subjects reported pain). Although perceived as very painful, a standard serum and electrolyte analysis indicates these effects are associated with minor physiological responses. Serum potassium increase was minor and myoglobin had no change from baseline levels. A secondary analysis of the data further shows the elevation in potassium level is insignificant (Appendix A). Regarding serum markers of muscle injury, a slight increase in creatine kinase was noted at 24 hours; however, we were unable to demonstrate a significant change from baseline. There is no apparent indication of direct cardiac cellular damage: cardiac markers C-reactive protein and troponin I remained at baseline immediately after X-26 TASER® exposure and at 24 hours. We did not observe any deviation of serum levels from baseline that would lead to a suggestion of induced cardiac damage. This data confirms the results in the literature.[1,2]

It has been postulated that a causal association between X-26 TASER® exposure and in-custody death (ICD) is due to an increase in levels of the neurotransmitter serotonin. Abnormal elevation of serotonin levels may induce Serotonin Syndrome—a suggested cause of the "excited delirium" state characteristic of ICD. Our findings do not support this claim; serotonin levels remained at baseline immediately following exposure and at 24 hours (Appendix A). The secondary blood marker analysis confirms that increase in serotonin level is non-significant. There are no known literature results for comparison.

We observed increased cortisol levels—to a borderline high range—indicating that X-26 TASER® exposure is a physiologically stressful event. These effects were not permanent, however; cortisol returned to baseline at 24 hours. Lactic acid (a waste product of anaerobic glycolysis) reached abnormally high levels immediately following the standard five-second application. The upsurge in lactic acid indicates that extensive muscle contraction was induced by the X-26 TASER®, creating an oxygen debt wherein anaerobic glycolysis took place to produce mechanical energy. This finding was the only clinically significant change observed, but not unexpected based on the understanding that X-26 TASER® devices are designed to incapacitate subjects by inducing full, involuntary contraction of muscles. Lactic acid levels returned to a normal baseline range within 24 hours—probably much sooner but the day after was the next collected sample.

Blood cell count with differential showed either no change or minor changes within normal ranges. Liver function and kidney function blood tests showed no change. Actual tissue damage, hence, was minor to non-existent. The pain felt by the subjects was due, thus, to the exogenous activation of the pain fibers by the X-26 TASER® stimulus rather than endogenous activation of pain fibers by damaged tissue. Other constraint methods are likely to induce similar pain effects; however, blunt force injury with a nightstick and/or struggle would likely result in actual tissue damage associated with the pain sensation.

Changes in ECG from baseline include sinus tachycardia, sinus arrhythmia, nonspecific ST segment and/or T wave abnormalities and premature atrial complexes (PACs). There is no

indication that sinus tachycardia (>100 bpm) following X-26 TASER® exposure is pathological. Sinus arrhythmia results as breathing patterns are disrupted while heart rate fluctuates.[4] It is attributable to extensive contraction of the diaphragm muscle (evidenced by abnormally high lactic acid levels post-exposure) during activation. Interpretation of nonspecific ST segments and/or T wave abnormalities is varied; however, they are commonly observed and may be manifested as either acute ST depressions or elevations, or decreased amplitude or slight inversion of the T wave.[5] ST segment and T wave irregularities are associated with non-pathologic early repolarization and frequently observed in healthy, young males—predominantly the makeup of this study population. Premature atrial complexes (PACs) are early heartbeats due to premature excitation of the atria. PACs are a common abnormality in electrical cardiac activity and benign.[6] No other abnormalities were observed. These results confirm the conclusion of the blood electrolyte and serum analysis: no permanent cardiac damage was incurred due to one X26 TASER application. This finding is also concurrent with those of other investigations on the X26.[1,2] The ECG changes are consistent with a likely increase in adrenergic state; yet, direct electrical effect of the X-26 TASER® stimulus on the heart (atria in particular given the higher incidence of atrial findings) cannot be ruled out.

The X-26 TASER®, with shoulder-to-waist electrode spread, induces a major degradation of coordinated psychomotor activity. A overwhelming majority (30 of 32) of the study population experienced a loss of motor function during exposure; two subjects were able to reach for and trigger the switchbox during the five-second exposure period. Close observation of these subjects showed that their movements were slowed and delayed response times were measured. The time delay imparted by the X-26 TASER® to complete the task was approximately equivalent to the duration of exposure. This finding suggests that the device can be used effectively in delaying an individual's response, such as detonating an explosive device. There is also no apparent indication of residual motor function impairment once the five-second exposure period ceases. Although it took the subjects about 1 additional second to press the button after the X-26 TASER® stimulus ended, this is a typical delay for task execution. Basically, subjects regained normal control or coordination and were able to trigger the switchbox with response times comparable to baseline. A slight increase in reaction time was observed (0.16 seconds), but a secondary analysis confirms that this difference is not significant (Appendix A). No evidence of psychomotor retardation following exposure was found.

Post-exposure interviews reveal that intense pain and immobilization are commonly experienced during X-26 TASER® exposure. Subjects were able to retain consciousness, hearing and vision capabilities before, during and after application. One subject claimed to have total control of their actions during exposure—however, this individual was unsuccessful in triggering the switchbox during the five-second period. Several participants claimed to retain partial control of their actions; only one of these individuals was successful in executing the task during the exposure period. Most subjects reported an inability to control their actions and perform simple commands (e.g. raising arms) during exposure. Furthermore, subjects stated they would be unable to continue the execution of a hypothetical attack if a X-26 TASER® had been used. Had subjects attempted said attack despite exposure, all claimed they would fail with opposition present (with the exception of one subject who triggered the switchbox during exposure).

Conclusions

With regard to the three null hypotheses:

1.) There is no apparent indication that respiratory function is significantly altered by a standard five-second X-26 TASER® exposure. Equipment limitations and the brief exposure period (five seconds, longer than the duration of one breath) make this hypothesis difficult to investigate. Observation of the subjects undergoing exposure indicates that breathing is possible due to frequent verbal utterances during exposure. The chest wall and abdomen musculature appeared uncoordinated, however, and this indicates altered breathing ability. A statistical analysis of the changes in respiratory function in response to X-26 TASER® exposure is permanently on hold due to low confidence in the data. Should it be determined that further respiratory data collection is necessary, reassessment of the approach or different equipment is needed to measure these parameters more frequently during the five-second exposure period. A trigger channel is also necessary (similar to the system for the button-press) to indicate the onset and cessation of X-26 TASER® application.

2.) There is no evidence that cardiac function is significantly altered. Using a standard laboratory blood analysis of cardiac markers and ECG recording, we were able to indicate that there is no discernable damage to cardiac muscle or evidence of ischemia based on an evaluation of post-exposure changes from baseline. Moreover, the subjects appeared awake, alert, and able to complete the button-press task immediately after exposure. The subjects did not appear to have any cardiogenic shock-type symptoms such as syncope, dizziness, or altered mental status.

3.) Serotonin levels are not significantly altered to a degree to induce Serotonin Syndrome. Levels after exposure remained in a normal range. X-26 TASER® exposure does not appear to have any direct effect on serotonin, rather it is likely secondary to X-26 TASER® exposure being somewhat stressful (as evidenced by a significant increase in cortisol, a stress related hormone). Thus, there is no indication that exposure to the X-26 TASER® (alone) is capable of elevating serotonin levels to the abnormal ranges giving rise to Serotonin Syndrome.

The data analysis confirms the results of studies conducted by Ho et al. (2006) and Vilke et al. (2007) that cardiac function is maintained during and after X-26 TASER® exposure in healthy subjects. It is evident that the device has a notable effect on coordination, but a return to baseline function is immediate. Response times following X-26 TASER® exposure are comparable to baseline, approximately one second. Two volunteers were able to trigger the switchbox during X-26 TASER® exposure, but a general delay in response time imparted by the X-26 TASER® is evident (and nearly equal to the stimulus duration of five seconds). A half-second pause between X-26 TASER® stimulations likely would prevent most subjects (n=30) from triggering the switchbox because 1 second of pause is needed to trigger the switchbox. Thus, the psychomotor assessment conducted in this study establishes that: 1) X-26 TASER® application provides a significant delay in response time and impairment of motor coordination and 2) these effects are not permanent and only imposed during the application of X-26 TASER® stimulus.

A statistician has confirmed that the data have high statistical power such that additional subjects need not be sought and enrolled for data collection. It should be noted that a new approach to respiratory monitoring will be needed if it is later decided that further respiratory function testing

is required. That said, the five-second exposure period itself is too brief to critically assess changes in respiratory function, and one standard application (5 sec) is the limit with current law enforcement training protocols such that this protocol would not allow longer stimulations.

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Tables and Figures

Table 1: Effects of X26 TASER Exposure on Blood Chemistry Characteristics for Study Subjects (n=32)

Blood Marker	Baseline	Post-Exposure	24-Hours Post Exposure
WBC (x10E3/uL)			
Mean	6.4	7	5.9
SD	1.3	1.3	1.4
Range	3.6-9.9	4.1-9.9	3.6-11
% Change (95% CI)		11.1 (7.5, 14.7)	(-)6.3 (-10.8, -1.7)
RBC (x10E6/uL)			
Mean	4.5	4.5	4.4
SD	0.5	0.4	0.4
Range	3.7-5.4	3.7-5.3	3.6-5.3
% Change (95% CI)		0.1 (-1.0, 1.1)	(-)1.6 (-3.0, -0.2)
Hemoglobin (g/dL)			
Mean	13.8	13.7	13.6
SD	1.1	1.1	1.1
Range	12-15.7	11.7-15.3	11.4-15.3
% Change (95% CI)		(-)0.3 (-1.2, 0.6)	(-)1.4 (-2.8, 0.04)
Hematocrit (%)			
Mean	40.2	40.2	39.3
SD	3.3	3	3.4
Range	35-44.9	35.2-44.7	34.1-46.1
% Change (95% CI)		0.3 (-0.7, 1.2)	(-)1.3 (-3.0, 0.4)
MCV (fL)			
Mean	89.9	89.8	89.8
SD	3.8	5.3	4.8
Range	83-98	70-100	70-97
% Change (95% CI)		0.4 (0.1, 0.8)	0.5 (-0.1, 1.1)
MCH (pg)			
Mean	31	30.6	30.8
SD	1.2	2	2
Range	29-33.9	22.3-33.2	22.4-34.1
% Change (95% CI)		(-)0.3 (-0.7, 0.1)	0.3 (-0.2, 0.7)
MCHC (g/dL)			
Mean	34.4	34.1	34.3
SD	0.5	0.7	0.8
Range	33.5-35.4	32-35.5	32-35.8
% Change (95% CI)		(-)0.5 (-0.9,-0.1)	0.02 (-0.9, 1.0)
RDW (%)			
Mean	13.5	13.5	13.5

SD	0.7	0.7	0.7
Range	12.3-15.2	12.4-15.8	12.1-15.4
% Change (95% CI)		0.06 (-0.6, 0.7)	(-)0.07 (-1.2, 1.0)
Platelets (x10E3/uL)			
Mean	226.1	234.4	228.6
SD	33.5	37.5	32.9
Range	159-315	165-315	167-306
% Change (95% CI)		2.4 (1.0, 3.9)	0.6 (-1.3, 2.6)
Neutrophils (%)			
Mean	60.7	58.9	59.9
SD	8.7	9.3	8.1
Range	31-75	29-73	48-82
% Change (95% CI)		(-)3.9 (-5.6, -2.2)	(-)0.3 (-6.5, 5.9)
Lymphs (%)			
Mean	28.8	30.8	28.9
SD	8.1	8.9	6.9
Range	13-55	17-60	13-42
% Change (95% CI)		8.9 (5.1, 12.7)	4.3 (-3.5, 12.1)
Monocytes (%)			
Mean	7.7	7.6	8.1
SD	1.97	2	2.7
Range	5-11.	5-12.	4-16.
% Change (95% CI)		0.6 (-4.3, 5.5)	4.4 (-1.7, 10)
Eos (%)			
Mean	2.3	2.1	2.5
SD	2	1.8	2.2
Range	0-9	0-8	0-10
% Change (95% CI)		(-)3.4 (-15.2, 8.3)	13.9 (-0, 27.8)
Basos (%)			
Mean	0.5	0.6	0.6
SD	0.5	0.5	0.5
Range	0-1	0-1	0-1
% Change (95% CI)		(-)13.8 (-27.1, -0.4)	(-)17.2 (-31.9, -2.6)
Neutrophils (Absolute) (x10E3/uL)			
Mean	3.9	4.2	3.6
SD	1.1	1.1	1.2
Range	1.1-6.8	1.2-6.7	2.1-8.5
% Change (95% CI)		6.9 (3.6, 10.1)	(-)5.1 (-16.7, 6.6)
Lymphs (Absolute) (x10E3/uL)			

Mean	1.8	2.1	1.7
SD	0.4	0.5	0.4
Range	0.6-2.6	0.9-3.3	0.7-2.4
% Change (95% CI)		22.8 (15.2, 30.3)	(-)2.8 (-7.7, 2.1)
Monocytes (Absolute) (x10E3/uL)			
Mean	0.5	0.5	0.5
SD	0.1	0.2	0.1
Range	0.3-0.8	0.3-0.9	0.2-0.8
% Change (95% CI)		12.9 (5.0, 20.9)	(-)3.9 (-9.2, 1.4)
Eos (Absolute) (x10E3/uL)			
Mean	0.2	0.2	0.1
SD	0.1	0.1	0.1
Range	0.0-0.6	0.0-0.7	0.0-0.6
% Change (95% CI)		2.5 (-8.6, 13.7)	(-)4.7 (-13.0, 3.6)
Baso (Absolute) (x10E3/uL)			
Mean	0.04	0.05	0.05
SD	0.05	0.05	0.05
Range	0-0.1	0-0.1	0-0.1
% Change (95% CI)		(-)10.3 (-22.1, 1.4)	(-)17.2 (-31.9, -2.6)
Glucose, Serum (mg/dL)			
Mean	90.2	96.2	91.5
SD	14.9	12	10.2
Range	59-116	63-113	75-116
% Change (95% CI)		8.5 (1.2, 15.7)	4.7 (-4.1, 13.4)
BUN (mg/dL)			
Mean	16	16.1	15
SD	4.5	5.1	4.2
Range	9-25.0	9-27.0	9-23.0
% Change (95% CI)		2.2 (-5.0, 9.5)	(-)4.2 (-9.1, 0.7)
Creatinine, Serum (mg/dL)			
Mean	1.1	1.1	1
SD	0.1	0.2	0.1
Range	0.8-1.4	0.7-1.5	0.8-1.4
% Change (95% CI)		1.5 (-3.1, 6.1)	(-)5.7 (-8.1, -3.2)
BUN/Creatinine Ratio			
Mean	15.4	15.2	15.3
SD	4.3	4.1	4.3
Range	9-26.0	9-25.0	9-24.0

% Change (95% CI)		0.3 (-3.1, 3.7)	1.4 (-3.9, 6.7)
Sodium, Serum (mmol/L)			
Mean	139.3	139.5	138.8
SD	1.9	2.2	1.5
Range	135-143	135-143	136-142
% Change (95% CI)		0.3 (-0.3, 0.8)	(-)0.4 (-0.9, 0.1)
Potassium, Serum (mmol/L)			
Mean	4	4	4.2
SD	0.2	0.3	0.2
Range	3.6-4.6	3.5-4.7	3.8-4.7
% Change (95% CI)		0.9 (-2.0, 3.9)	3.3 (0.7, 5.8)
Chloride, Serum (mmol/L)			
Mean	101.2	101.3	102.6
SD	2.3	1.9	2.5
Range	96-106	97-105	97-107
% Change (95% CI)		0.2 (-0.4, 0.8)	1.3 (0.4, 2.2)
Carbon Dioxide, Total (mmol/L)			
Mean	24.2	23.5	23.6
SD	2.6	2.6	1.9
Range	19-28	17-27	19-28
% Change (95% CI)		(-)2.5 (-6.1, 1.2)	(-)1.3 (-5.1, 2.5)
Calcium, Serum (mg/dL)			
Mean	9.5	9.5	9.5
SD	0.3	0.3	0.3
Range	8.8-10.1	8.9-10.5	9-10.
% Change (95% CI)		0.4 (-0.6, 1.3)	(-)0.2 (-1.2, 0.8)
Protein, Total, Serum (g/dL)			
Mean	7.3	7.3	7.2
SD	0.4	0.3	0.4
Range	6.5-8.4	6.5-7.8	6.4-8.3
% Change (95% CI)		(-)0.5 (-2.6, 1.6)	(-)0.9 (-2.9, 1.1)
Albumin, Serum (g/dL)			
Mean	4.7	4.6	4.6
SD	0.3	0.3	0.3
Range	4.1-5.2	3.8-5.1	4.1-5.3
% Change (95% CI)		(-)1.5 (-3.6, 0.7)	(-)1.5 (-3.7, 0.6)
Globulin, Total (g/dL)			
Mean	2.6	2.6	2.6
SD	0.3	0.2	0.3

Range	2-3.3	2.2-3.1	2.1-3.5
% Change (95% CI)		1.6 (-2.1, 5.3)	0.7 (-2.8, 4.2)
A/G Ratio			
Mean	1.8	1.8	1.8
SD	0.3	0.2	0.2
Range	1.4-2.5	1.4-2.1	1.4-2.3
% Change (95% CI)		(-)1.8 (-5.6, 1.9)	(-)0.5 (-4.2, 3.2)
Bilirubin, Total (mg/dL)			
Mean	0.7	0.7	0.6
SD	0.3	0.3	0.3
Range	0.2-1.5	0.2-1.4	0.2-1.4
% Change (95% CI)		(-)1.0 (-6.3, 4.3)	2.0 (-9.7, 13.8)
Alkaline Phosphatase, S (IU/L)			
Mean	66.2	69.1	62.4
SD	16.1	20.3	15.7
Range	40-100	41-142	28-92
% Change (95% CI)		5.5 (-6.4, 17.4)	(-)5.4 (-8.9, -1.9)
AST (SGOT) (IU/L)			
Mean	28.6	29	31.8
SD	9.4	9.6	23.3
Range	19-69	16-68	18-154
% Change (95% CI)		0.7 (-4.0, 5.4)	(-)2.1 (-6.1, 1.9)
ALT (SGPT) (IU/L)			
Mean	28.7	29.1	37.6
SD	10.4	11.9	49.5
Range	16-56	13-54	16-303
% Change (95% CI)		(-)2.3 (-6.7, 2.2)	(-)1.6 (-4.9, 1.7)
Troponin I (ng/mL)			
Mean	<0.2	<0.2	<0.2
SD	0	0	0
Range	<0.2	<0.2	<0.2
% Change (95% CI)		0	0
C-Reactive Protein, Cardiac (mg/L)			
Mean	1.4	1.4	1
SD	1.4	1.3	0.8
Range	0.2-6.1	0.2-5.9	0.2-3.7
% Change (95% CI)		1.8 (-8.1, 11.8)	(-)13.3 (-32.4, 5.8)
ln(C-Reactive Protein, Cardiac) (ln(mg/L))			
Mean	-0.04	-0.04	-0.28

SD	0.9	0.9	0.8
Range	(-)1.6-1.8	(-)0.4-8	(-)1.0-0.9
% Change (95% CI)		0.0 (-0.08, 0.2)	(-)0.26 (-0.4, 0.5)
LDH (IU/L)			
Mean	210.5	210.6	215.5
SD	44.6	39.6	42
Range	110-339	100-286	169-364
% Change (95% CI)		0.6 (-4.3, 5.6)	3.1 (-4.5,10.8)
Serotonin, Serum (ng/mL)			
Mean	39	41.7	37.9
SD	32.1	29.9	27.3
Range	8-148	8-165	7-140
% Change (95% CI)		33.8 (3.5, 64.1)	40.5 (0.6, 80.5)
ln(Serotonin, Serum) (ln(ng/mL))			
Mean	3.4	3.5	3.4
SD	0.7	0.6	0.6
Range		2.1-5.1	1.9-4.9
% Change (95% CI)		0.1 (-0.1, 0.3)	0.03 (-0.3, 0.4)
Lactic Acid, Plasma (mg/dL)			
Mean	12.2	21	9.6
SD	4	5.8	4.1
Range	7.3-26.3	10.9-35.9	5-26.
% Change (95% CI)		81.1 (61.8, 100.4)	(-)18.4 (-30.0, -6.9)
Myoglobin, Serum (ng/mL)			
Mean	36.8	44.7	37.9
SD	11.9	51	13.9
Range	22-75	19-310	20-73
% Change (95% CI)		15.6 (-17.6, 48.8)	6.7 (-3.5, 16.9)
Cortisol (ug/dL)			
Mean	14.6	19.9	11.4
SD	4.8	5.5	3.9
Range	6.4-23.5	12.1-31.2	5.4-21.9
% Change (95% CI)		42.9 (29.6, 56.3)	(-)18.4 (-29.1,-7.6)
Creatine Kinase, Total, Serum (U/L)			
Mean	313.5	306.1	326.5
SD	227.2	214.8	182.1
Range	131-1184	80-1124	121-885
% Change (95% CI)		(-)1.3 (-6.7, 4.2)	16.5 (4.2, 28.8)

ln(Creatine Kinase, Total, Serum) (ln(U/L))			
Mean	5.6	5.6	5.7
SD	0.5	0.6	0.5
Range	4.9-7.1	4.4-7.0	1.9-4.9
% Change (95% CI)		(-)0.03 (-0.1, 0.04)	0.02 (0.02, 0.2)

Note: Percent change shown indicates change with respect to baseline values.

Table 2: Summary of Electrocardiogram Analysis for Study Subjects Before and After X26 TASER Exposure

(a) ECG Abnormalities Present Pre- Exposure

Observation	Explanation	Prevalence
10	Sinus Tachycardia (>100)	F840, H880, J330, L300, X620
8	Sinus Arrhythmia	I310, O411
63	Nonspecific ST and/or T Wave Abnormalities	Y640

(b) ECG Abnormalities Emerging Post-Exposure

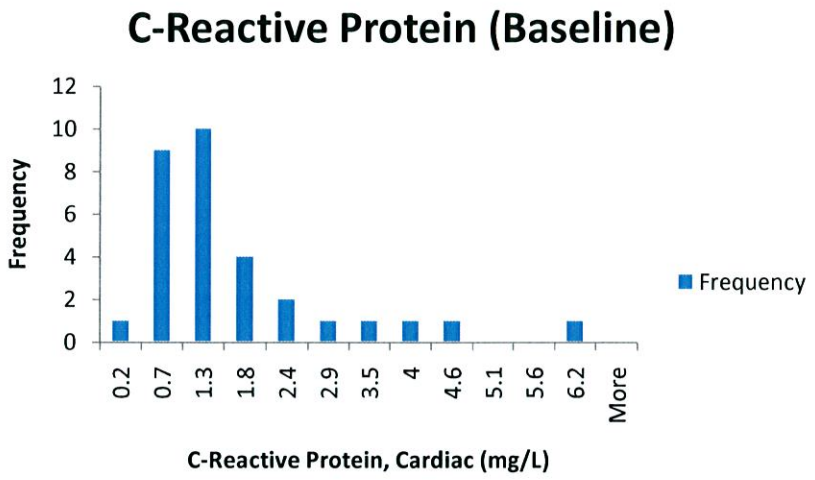
Observation	Explanation	Prevalence
10	Sinus Tachycardia (>100)	Q971, T940, O411, O930, Z090
8	Sinus Arrhythmia	K370, S990, X620, U580
63	Nonspecific ST and/or T Wave Abnormalities	G830, O411
13	Atrial Premature Complexes	T940

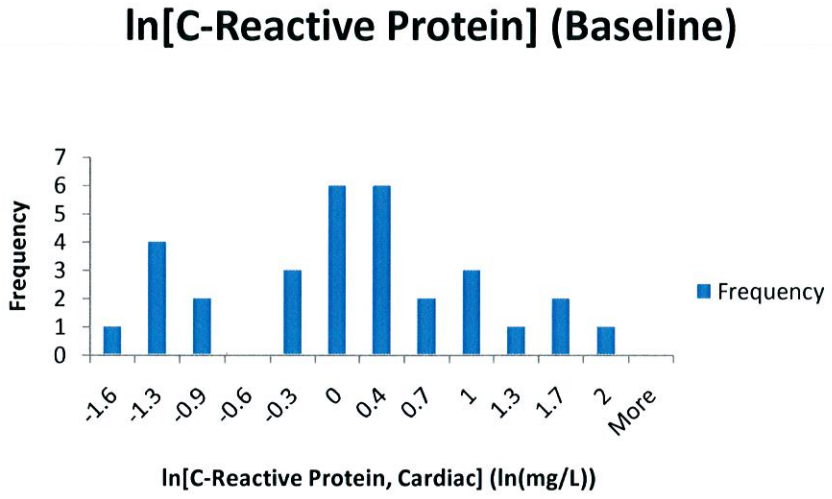
Table 3: Summary of Post- **X-26 TASER®** Exposure Interviews with Study Subjects

Question	N	Response
Describe in your own words how you felt during and after TASER exposure.	32	Immobility (37.5%) Immobility and pain (28.1%) Pain (15.6%) Electrical sensation (15.6%) Inability to focus (12.5%) Fear (6.3%)
Were you conscious of your surroundings during exposure?	32	Yes (75%) No (18.8%) Somewhat (6.2%)
What were you thinking of during exposure?	32	Pain (40.6%) Endurance (40.6%) Task (28.1%) Surprise (9.4%)
After exposure?	13	Task (53.8%) Relief (46.5%)
Do you think you could you have thought of other things like continuing an attack that you started before the exposure?	31	No (45.2%) Possibly (32.2%) - with external cue Yes (22.6%)
Were you able to hear during exposure?	32	Yes (90.6%) Not sure (6.3%) No (3.1%)
Were you able to see during exposure?	32	Yes (81.3%) Not sure (15.6%) No (3.1%)
Were you able to control your actions during the exposure?	32	No (71.9%) Partially (25%) Yes (3.1%)
How long do you think it took you to regain control?	31	< 1 second (80.6%) 1-4 seconds (19.4%)
How long do you think it took you to be able to push the button?	32	0-1 seconds (40.6%) 2-3 seconds (40.6%) 4-5 seconds (15.6%) Distracted (9.4%)
Do you think you could understand commands given during exposure?	32	Yes (90.6%) No (9.4%)
After the exposure?	32	Yes (96.9%) No (3.1%)
Do you think you would have been able to obey a simple command like to put up your hands or to lie down on the ground something a police officer would tell you to do, during exposure?	32	No (87.5%) Yes (12.5%)
After exposure?	7	Yes (100%)
Do you think if you were attacked by someone before the exposure you could have continued the attack during the exposure?	32	No (96.9%) Possibly (3.1%)
What do you think would have happened if you tried to do that?	27	Fall (59.3%) Inability to move (33.3%) Expect additional exposure (3.7%) Partial mobility (3.7%)

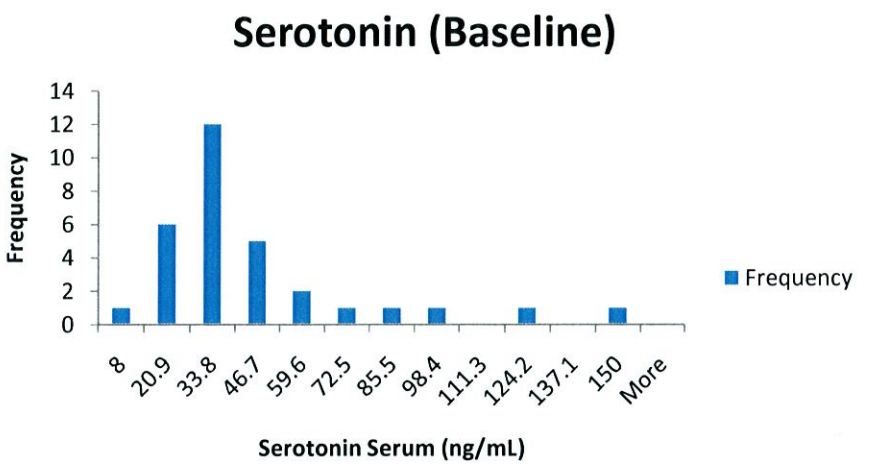
Figure 1: Blood Serum Markers Before and After Application of Natural Logarithmic Transform

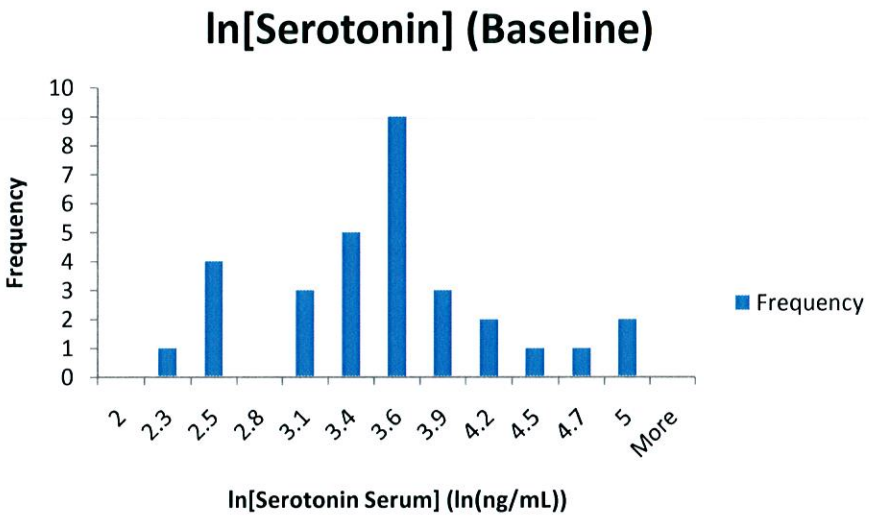
(a) C-Reactive Protein, Cardiac (n=31)



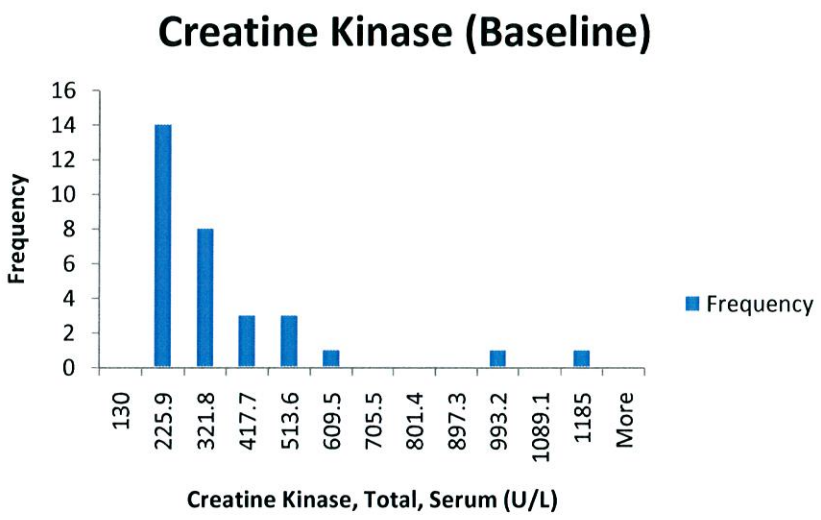


(b) Serotonin Serum (n=31)





(c) Creatine Kinase, Total, Serum (n=31)



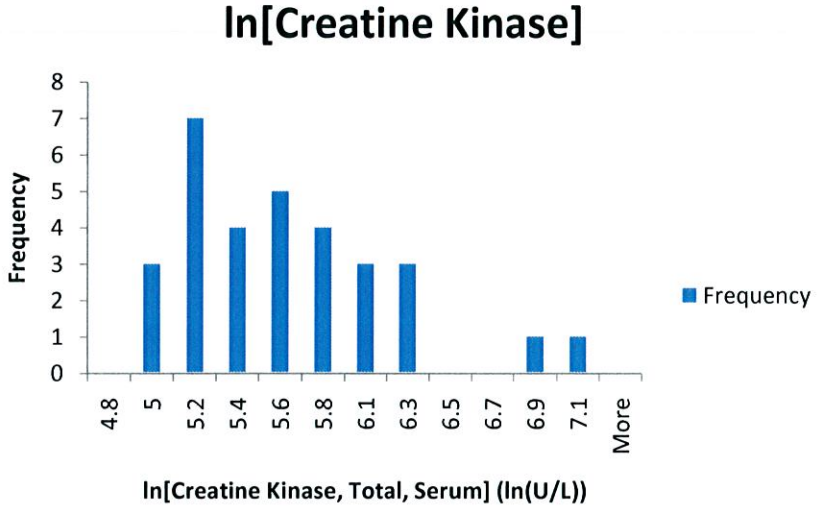
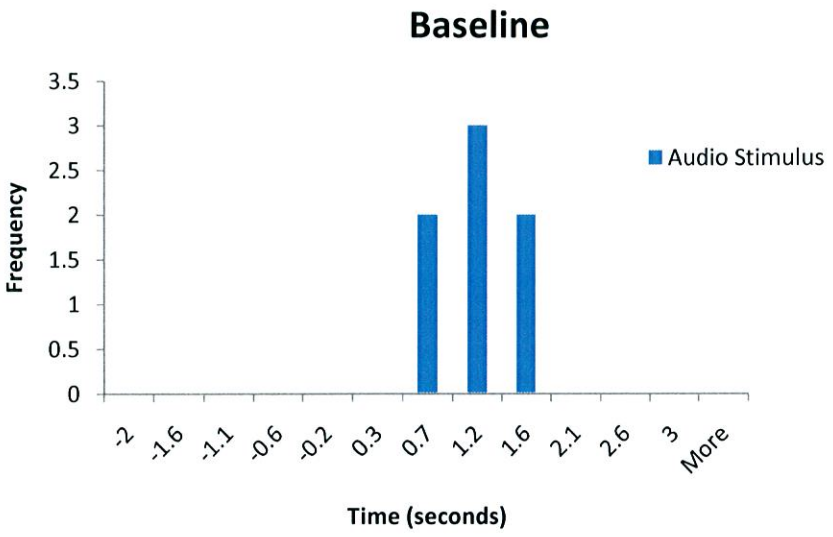


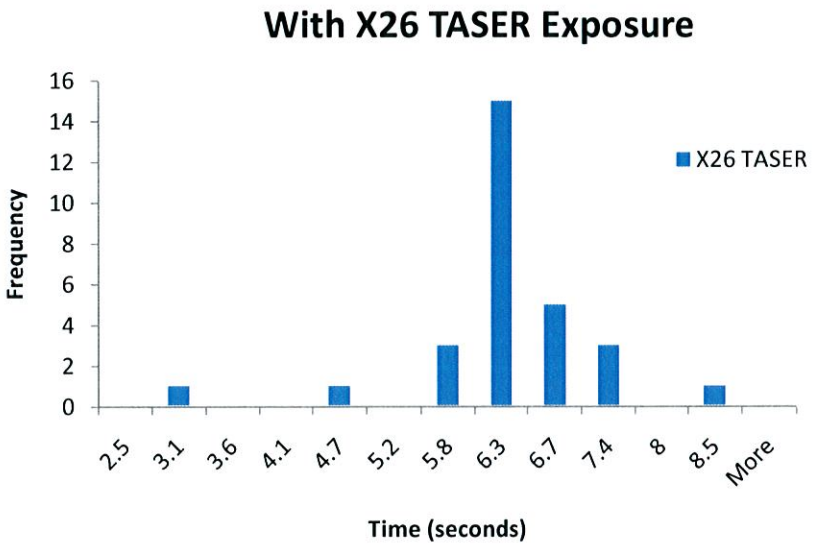
Figure 2: Effects of **X-26 TASER®** on Psychomotor Function During Exposure

(a) Average baseline time delay (audio stimulus) to execute the button-press task is 0.98 seconds (n=7)



Note: time=0 corresponds to initiation of auditory stimulus

(b) Average time delay with **TASER®** stimulus applied is 6.06 seconds (n=30)



(c) Delay in response time between groups is 5.08 seconds (approximately equal to the duration of **X-26 TASER®** exposure)

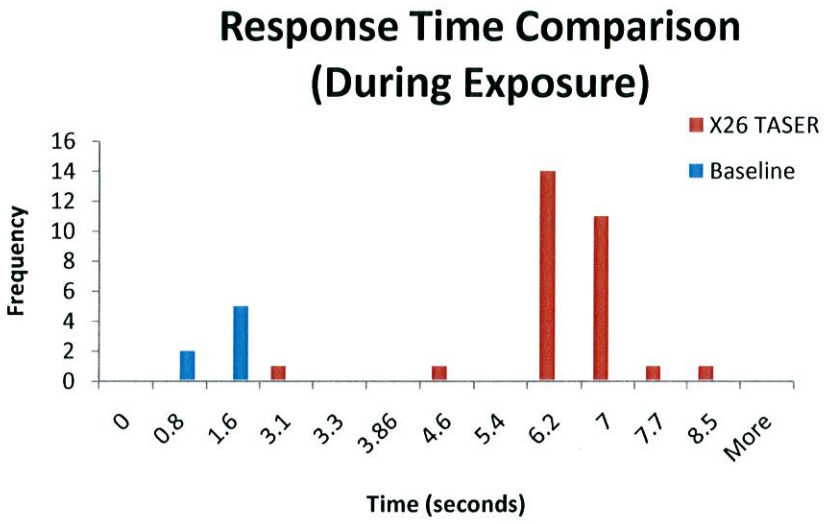
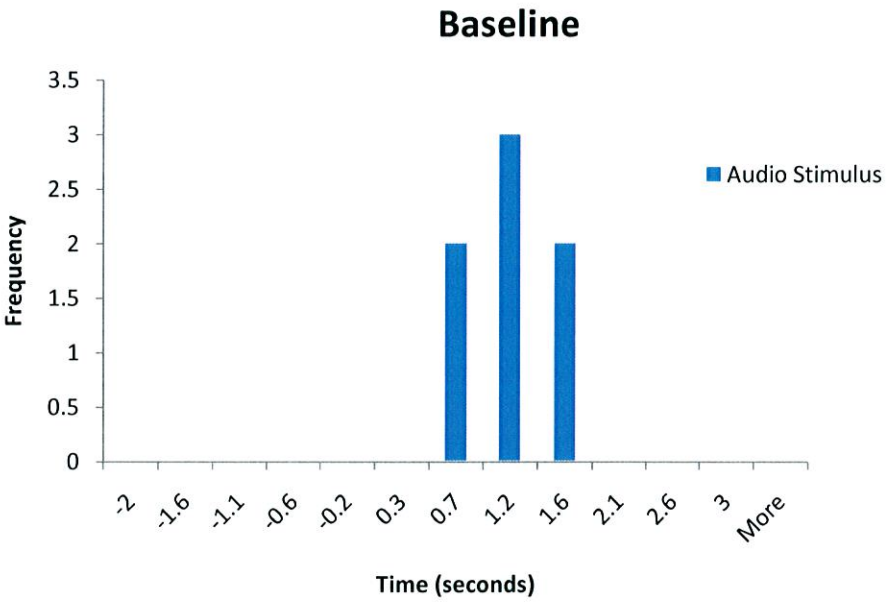


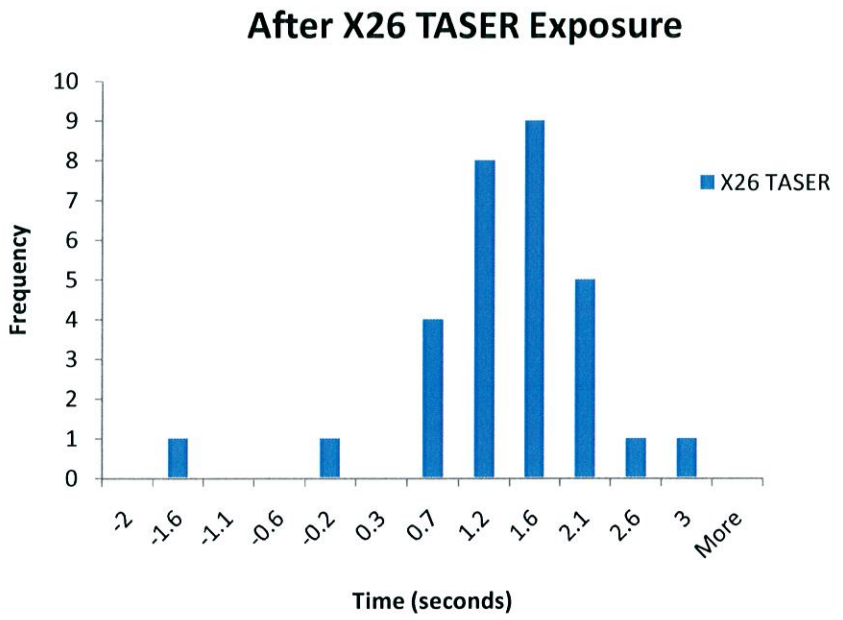
Figure 3: Effects of **X-26 TASER®** on Psychomotor Function After Exposure

(a) Average baseline time delay (audio stimulus) to execute the button-press task is 0.98 seconds (n=7)



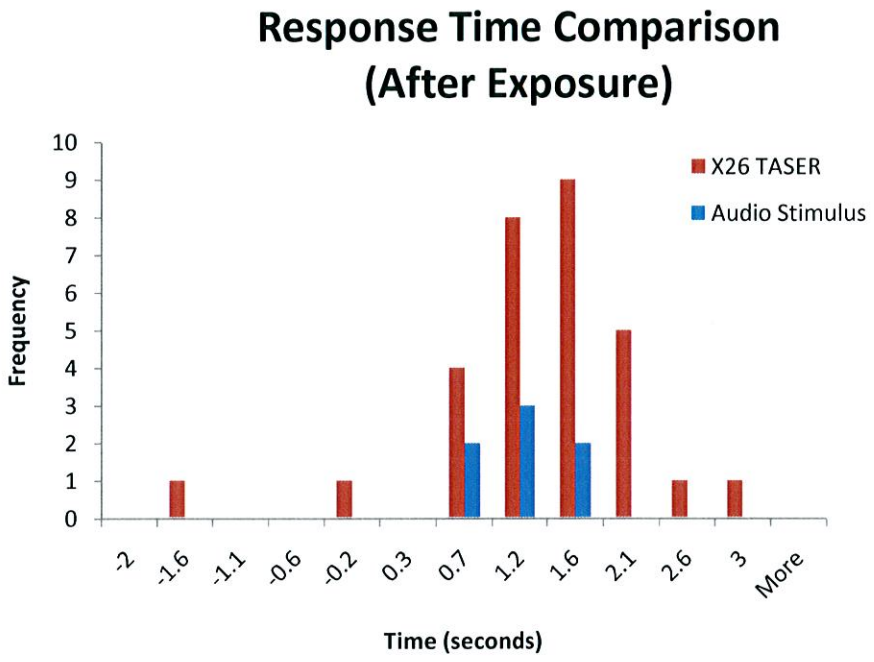
Note: time=0 corresponds to initiation of auditory stimulus

(b) Average response time to execute the button-press task upon cessation of the 5-second **X-26 TASER®** stimulus is 1.14 seconds (n=30)



Note: stimulation begins at time= -5 (not shown); time=0 corresponds to the end of exposure

(c) Average difference in response time between the two groups is 0.16 seconds



Appendix A:

X-26 TASER® Study
Secondary Statistical Analysis

Dr. May Boggess
Department of Statistics
Texas A&M University

19 March 2009

Summary of Findings

No evidence was found to suggest that X-26 TASER® exposure lengthens median button press response time. [Dr. Boggess was asked to assess the response time after the exposure ends, so "response time" in this report by Dr. Boggess means response time after the exposure ends. Dr. Criscione did not ask Dr. Boggess for a statistical assessment on the button press during X-26 TASER® exposure because it was obvious that the ability to perform the button press test was greatly impaired during the exposure. Bracketed comment added by Dr. Criscione after submission of Dr. Boggess' report].

Only one statistically significant difference of a magnitude of clinical significance was found among the forty three serum variables. More precisely, some differences, between baseline and post and baseline and 24-hour post, were found to be statistically significant at the 5% level, but only one was for a difference of more than two baseline standard deviations from baseline.

The variable showing the largest significant difference was Lactic Acid, which showed an 80% increase between the baseline and post tests.

The power for all tests which failed to find a significant difference is greater than 90%, and thus there is no evidence to suggest that further samples need to be collected to reduce the risk of false negatives.

Contents

Methods

Button Press Analysis

Measurements were taken on twenty nine participants of the amount of time to press a button following the cessation of the TASER® exposure. As a control, measurements were taken on seven participants of the amount of time to press a button following an audio stimulus.
To obtain an estimate of the median response times, together with confidence intervals, a quantile regression model with bootstrap standard errors was used. Bootstrap is an empirical method for error calculation which does not rely on any distributional assumptions so is used in situations where assumptions may not be met. In this case the four common participants in the audio and in the TASER group introduce the possibility of correlated observations, which would violate the assumption of independence common to many statistical models. This is handled in the bootstrap method by taking replication samples at the level of the individual, rather than at the level of observations.

Blood serum Analysis

Thirty two subjects were involved in the serum study. Blood was collected immediately before the TASER, baseline, and immediately after, post. A second follow up sample was collected 24 hours later. There was some missing data for some variables for some participants.

Forty four variables were measured. Two of these, GlomFiltRateEst and IfAfricanAmerican, contained all missing values. A third, TroponinI, had all values as either missing or <0.2. For three variables a natural logarithm transform was applied to improve normality, CReactiveProteinCardiac, SerotoninSerum and CreatineKinaseTotalSerum.

For each serum variable the following analysis was carried out:

- Determine the sample size by removing participants with some missing data for this variable.
- Calculate mean, median, standard deviation and range for the baseline, post and 24-hour post measurements.
- Obtain the two differences, baseline minus post, and baseline minus 24-hour post, for each participant, and calculate the mean, median, standard deviation and range for each difference.
- Calculate two 95% confidence intervals, one for the mean of the difference and one for the percentage difference from baseline.
- Perform non-parametric tests appropriate for paired data. Wilcoxon's signed-rank test is a test which requires no distributional assumptions to test if the difference between two groups has median zero. This test can be used on normal and non-normal data. If one has data which is not normally distributed, then this test is preferable. A small p-value from this test indicates that the median difference is different from zero.
- Carry out the Shapiro-Wilks normality test on each of the differences. The null hypothesis for this test is that the difference is normally distributed, so a large p-value indicates that the sample shows no evidence of a lack of normality. In this case, a paired t-test is appropriate.
- Lastly perform the t-tests which have null hypothesis that the difference is mean zero. Thus a small p-value indicates the mean difference is different from zero.

For each variable three plots are given:

- A box plot of baseline, post and 24-hour post. The line in the middle of the box is the median. The upper edge of the box is the 75^{th} percentile. The lower edge of the box is the 25^{th} percentile, thus the box contains 50% of the data. Points beyond the whiskers are outliers. This plot of the data can give a rough indication of whether or not a noticeable change has occurred.
- A box plot of the two differences. This plot is a visual check of the normality of the differences. Shapiro-Wilks normality test can be sensitive the presence of outliers. This plot can give additional information about the distribution. The Central Limit Theorem will ensure approximate normality of the mean of a sample of size close to thirty, as long as the data is not heavily skewed. Therefore a small p-value on the Shapiro-Wilks test can be overlooked if the box plot reveals a reasonable level of symmetry (meaning, the line is in the middle of the box and the whiskers are approximately the same length)
- A plot of the 95% confidence intervals of the mean. This plot is a way to visualize the results of the t-test, since if the confidence interval crossed the horizontal line at zero, this indicates that zero is a plausible for the mean and we expect the t-test to fail to reject the null (that is, have a large p-value).

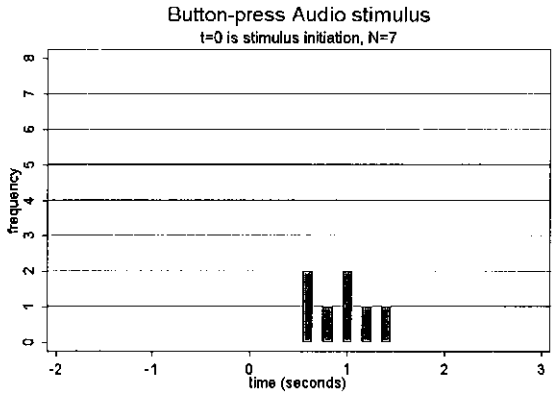
In the event that no significant difference is found using an hypothesis test, there is a possibility that this is false negative result. This can occur as a result of too little data, however the probability of making this mistake can be calculated in certain circumstances. One minus that probability is called the power of the test, so the closer the power to 10% the less likely a false positive result

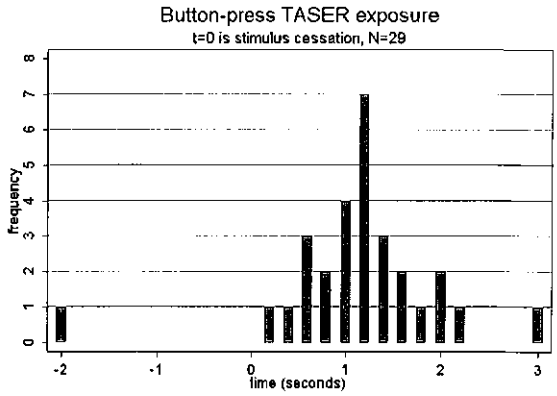
To calculate the power of a t-test that has been performed a number of pieces of information are needed. Firstly the sample size (as the larger the sample size the larger the power)., and secondly the amount of variation in the data (since the more variation the more difficult it is to determine if there is a difference). Thirdly, the size difference we need to be able to detect accurately needs to be specified. Here the baseline standard deviation was used as a relevant change that we should be able to detect accurately. For example, if the power of detecting a difference of 0.1 from the true population mean is 90% at the given sample size and variation, there is a 10% chance that the false negative is in error.

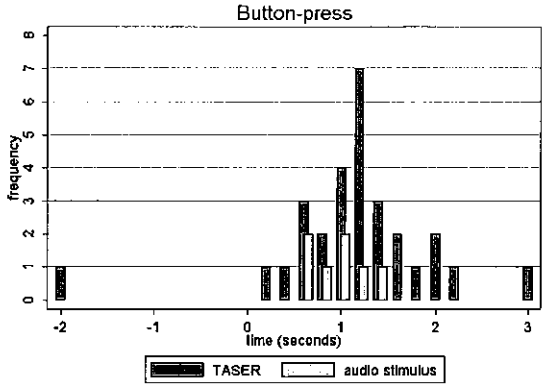
Power calculations for the Wilcoxon singed-rank test are not performed as there is no closed-form formula available.

Button Press Analysis

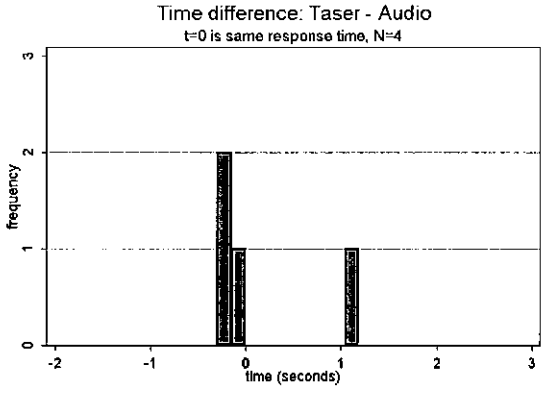
Measurements were taken on twenty nine participants of the amount of time to press a button following the cessation of the X-26 TASER® exposure. As a control, measurements were taken on seven participants of the amount of time to press a button following an audio stimulus. These data are displayed in the following three histograms.



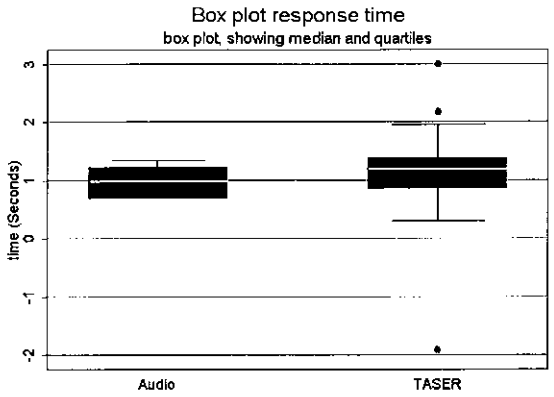




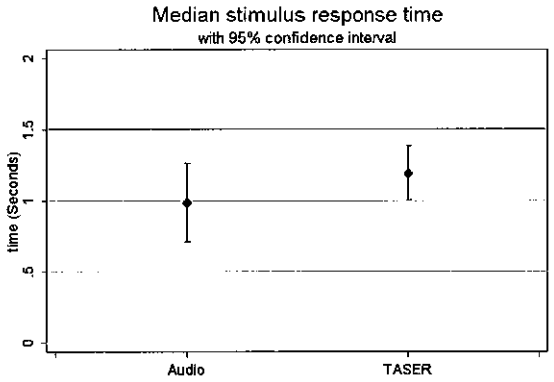
Four of these seven were part of the exposure group. Below is a histogram of the response time differences for these four participants.



The box plot below shows the distribution of the response time data.

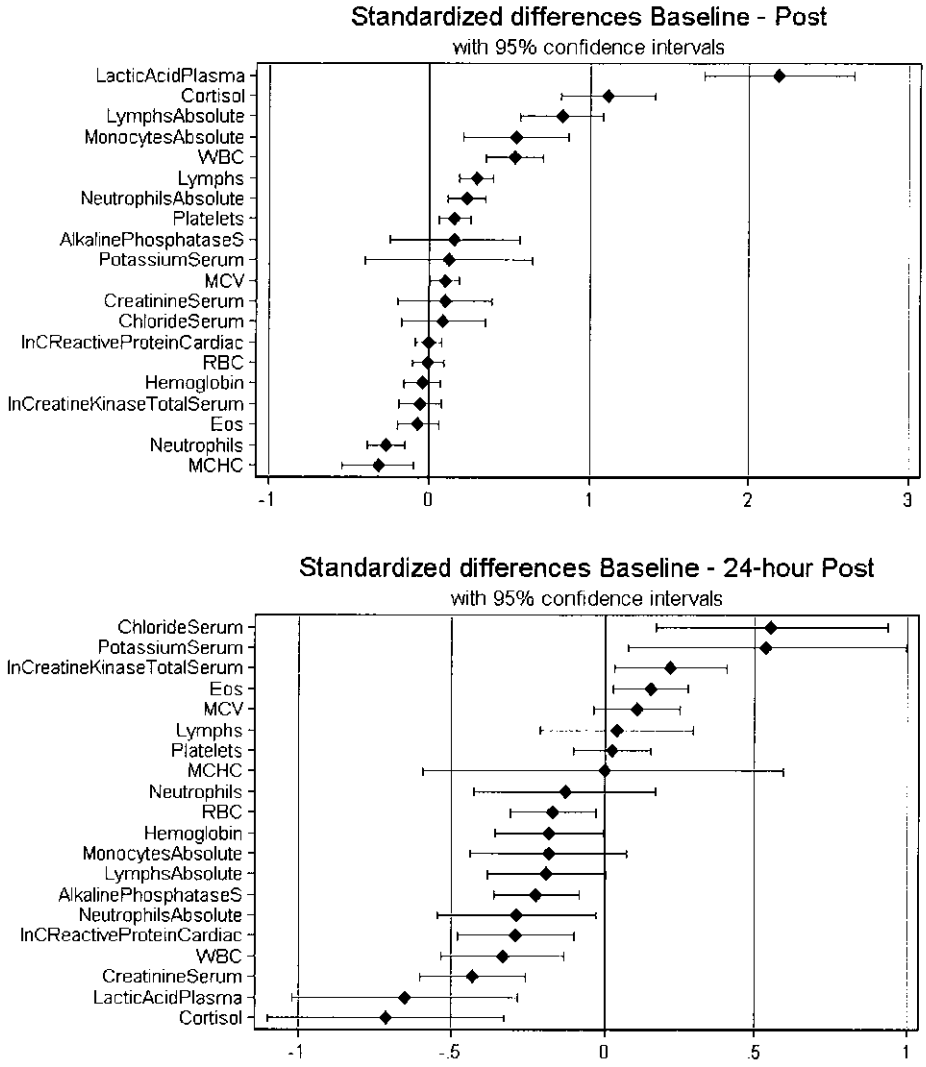


The difference in spread between the two groups is notable, as are the outliers in the X-26 TASER® group. To obtain an estimate of the median response times, together with confidence intervals, a quantile regression model with bootstrap standard errors was used. The predicted median times from the model are shown below.



The X-26 TASER® median response time is slightly longer than the audio stimulus, but not significantly so. Notice that the confidence interval for the X-26 TASER® group is not as wide as for the Audio group. This is in part caused by the large difference in sample size of the two groups: 29 in the X-26 TASER® group and 7 in the control.

Summary of Serum Analysis



The standardized difference shown above is the mean difference divided by the baseline standard deviation. Thus 1 on the horizontal axis indicates a difference of one standard deviation from the baseline has occurred. The upper and lower bounds of the 95% confidence interval, also divided by standard deviation to preserve scale, is also shown.
Variables not shown in these summary plots had no significant difference between baseline and post and no significant difference between baseline and the 24-hour post.

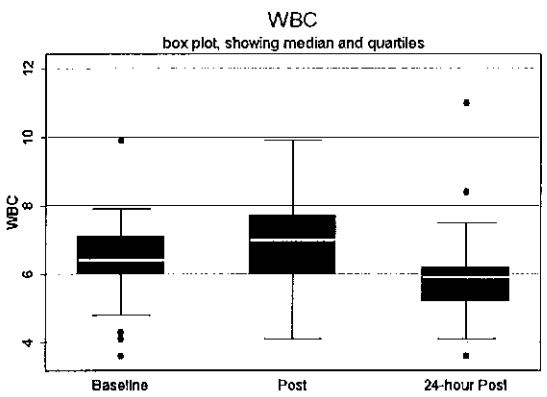
Summary: Baseline to Post

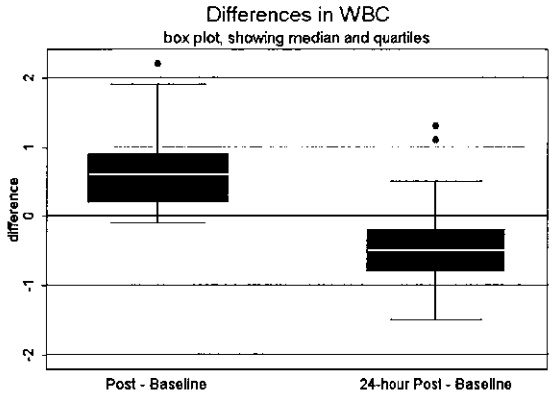
	Mean Difference	Baseline SD	Mean diff. /SD	Statistical significance	Clinical significance
WBC	0.67	1.26	0.53	yes	
RBC	0.00	0.45	-0.01		
Hemoglobin	-0.05	1.13	-0.04		
Hematocrit	0.07	3.31	0.02		
MCV	0.38	3.76	0.10	yes	
MCH	-0.10	1.24	-0.08		
MCHC	-0.17	0.54	-0.32	yes	
RDW	0.01	0.65	0.01		
Platelets	5.38	33.52	0.16	yes	
Neutrophils	-2.31	8.70	-0.27	yes	
Lymphs	2.41	8.13	0.30	yes	
Monocytes	0.00	1.97	0.00		
Eos	-0.14	2.02	-0.07		
Basos	0.03	0.51	0.07		
NeutrophilsAbsolute	0.26	1.07	0.24	yes	
LymphsAbsolute	0.37	0.44	0.83	yes	
MonocytesAbsolute	0.06	0.11	0.54	yes	
EosAbsolute	0.01	0.14	0.08		
BasoAbsolute	0.01	0.05	0.14		
GlucoseSerum	5.62	14.93	0.38		
BUN	0.31	4.45	0.07		
CreatinineSerum	0.01	0.15	0.10		
BUNCreatinineRatio	-0.03	4.35	-0.01		
SodiumSerum	0.34	1.95	0.18		
PotassiumSerum	0.03	0.22	0.12		
ChlorideSerum	0.21	2.30	0.09		
CarbonDioxideTotal	-0.71	2.64	-0.27		
CalciumSerum	0.03	0.34	0.09		
ProteinTotalSerum	-0.05	0.38	-0.13		
AlbuminSerum	-0.07	0.25	-0.29		
GlobulinTotal	0.02	0.30	0.08		
AGRatio	-0.04	0.25	-0.18		
BilirubinTotal	-0.02	0.27	-0.06		
AlkalinePhosphataseS	2.55	16.09	0.16		
AST_SGOT	0.10	9.42	0.01		
ALT_SGPT	-0.48	10.38	-0.05		
lnCReactiveProteinCardiac	0.00	0.92	-0.00		
LDH	0.40	44.55	0.01		
lnSerotoninSerum	0.14	0.72	0.20		
LacticAcidPlasma	8.86	4.04	2.19	yes	yes
MyoglobinSerum	-0.43	11.67	-0.04		
Cortisol	5.33	4.79	1.11	yes	yes
lnCreatineKinaseTotalSerum	-0.03	0.53	-0.05		

Summary: Baseline to 24-hour post

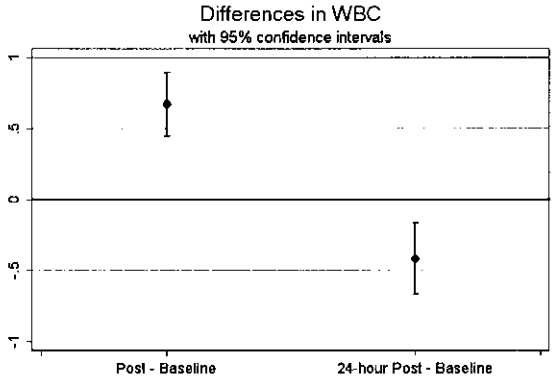
	Mean Difference	Baseline SD	Mean diff. /SD	Statistical significance	Clinical significance
WBC	-0.42	1.26	-0.33	yes	
RBC	-0.08	0.45	-0.17	yes	
Hemoglobin	-0.20	1.13	-0.18	yes	
Hematocrit	-0.56	3.31	-0.17		
MCV	0.41	3.76	0.11		
MCH	0.08	1.24	0.07		
MCHC	0.00	0.54	0.00		
RDW	-0.01	0.65	-0.02		
Platelets	0.90	33.52	0.03		
Neutrophils	-1.10	8.70	-0.13		
Lymphs	0.34	8.13	0.04		
Monocytes	0.34	1.97	0.18		
Eos	0.31	2.02	0.15	yes	
Basos	0.10	0.51	0.20		
NeutrophilsAbsolute	-0.31	1.07	-0.29	yes	
LymphsAbsolute	-0.08	0.44	-0.19		
MonocytesAbsolute	-0.02	0.11	-0.18		
EosAbsolute	-0.01	0.14	-0.05		
BasoAbsolute	0.01	0.05	0.14		
GlucoseSerum	1.31	14.93	0.09		
BUN	-0.79	4.45	-0.18		
CreatinineSerum	-0.06	0.15	-0.43	yes	
BUNCreatinineRatio	0.10	4.35	0.02		
SodiumSerum	-0.59	1.95	-0.30		
PotassiumSerum	0.12	0.22	0.54	yes	
ChlorideSerum	1.28	2.30	0.55	yes	
CarbonDioxideTotal	-0.52	2.64	-0.20		
CalciumSerum	-0.02	0.34	-0.07		
ProteinTotalSerum	-0.07	0.38	-0.19		
AlbuminSerum	-0.08	0.25	-0.32		
GlobulinTotal	0.01	0.30	0.02		
AGRatio	-0.02	0.25	-0.08		
BilirubinTotal	-0.01	0.27	-0.04		
AlkalinePhosphataseS	-3.55	16.09	-0.22	yes	
AST_SGOT	-1.03	9.42	-0.11		
ALT_SGPT	-0.55	10.38	-0.05		
lnCReactiveProteinCardiac	-0.26	0.92	-0.29	yes	
LDH	5.70	44.55	0.13		
lnSerotoninSerum	0.03	0.72	0.04		
LacticAcidPlasma	-2.63	4.04	-0.65	yes	
MyoglobinSerum	1.87	11.67	0.16		
Cortisol	-3.43	4.79	-0.72	yes	
lnCreatineKinaseTotalSerum	0.12	0.53	0.22	yes	

WBC (x10E3/uL)

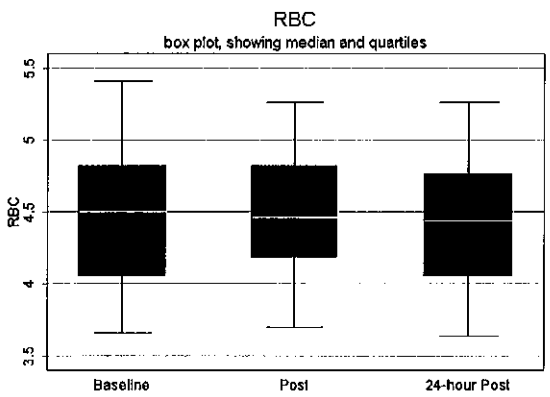


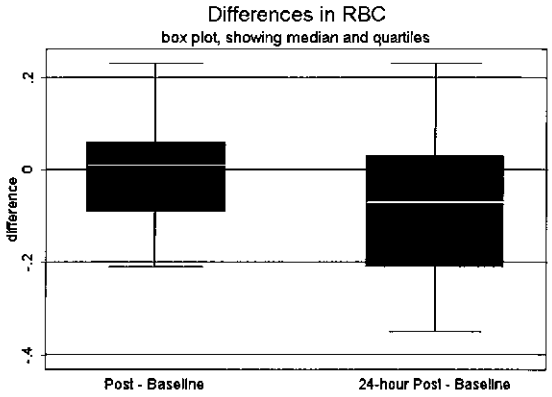


	Baseline	Post	24-Hour Post	Post - Baseline	24 Hour - Baseline
N	29	29	29	29	29
Mean	6.35	7.02	5.93	0.67	-0.42
Median	6.40	7.00	5.90	0.60	-0.50
Standard dev.	1.26	1.35	1.41	0.59	0.66
Range	3.60-9.90	4.10-9.90	3.60-11.00	-0.10-2.20	-1.50-1.30
Change 95% Confidence interval				0.67 (0.45, 0.90)	-0.42 (-0.67, -0.17)
Percentage Change 95% Confidence interval				11.08 (7.45, 14.70)	-6.26 (-10.79, -1.73)
Wilcoxon signed-ranks test of difference: p-value				0.00000	0.00127
Normality test of difference: p-value				0.04111	0.07719
T-test of difference: p-value				0.00000	0.00210

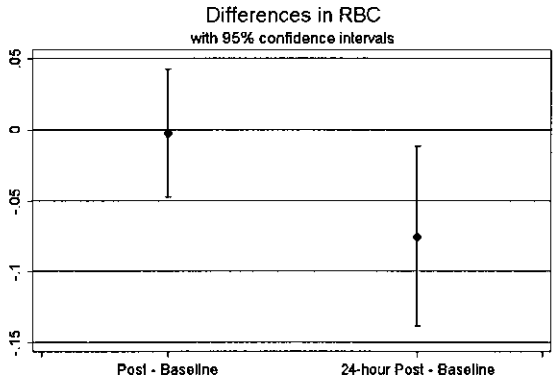


RBC (x10E6/uL)

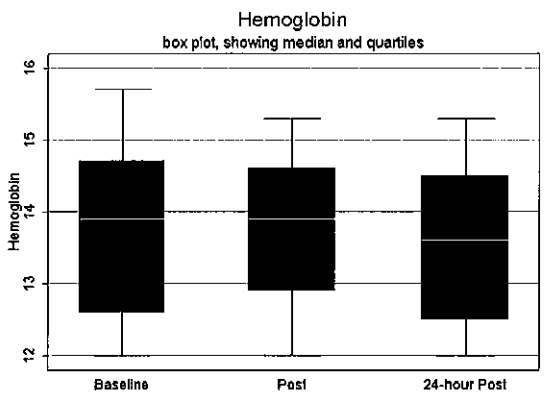


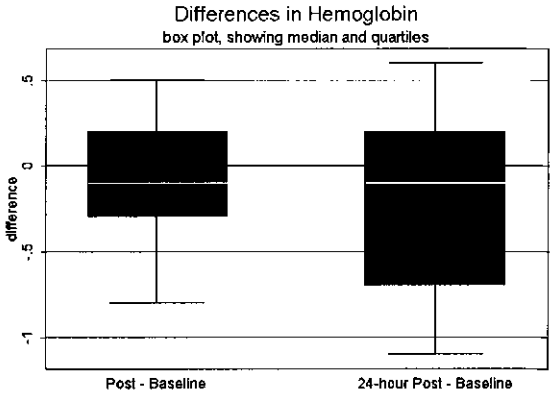


	Baseline	Post	24-Hour Post	Post - Baseline	24 Hour - Baseline
N	29	29	29	29	29
Mean	4.47	4.47	4.40	0.00	-0.08
Median	4.50	4.46	4.44	0.01	-0.07
Standard dev.	0.45	0.42	0.45	0.12	0.17
Range	3.66-5.41	3.70-5.26	3.64-5.26	-0.21-0.23	-0.35-0.23
Change 95% Confidence interval				0.00 (-0.05, 0.04)	-0.08 (-0.14, -0.01)
Percentage Change 95% Confidence interval				0.05 (-0.96, 1.06)	-1.61 (-3.03, -0.20)
Wilcoxon signed-ranks test of difference: p-value				0.46121	0.01569
Normality test of difference: p-value				0.85232	0.48444
T-test of difference: p-value				0.91356	0.02189
Power of T-test to detect difference of 1/2 SD				100%	
Power of T-test to detect difference of 1 SD				100%	

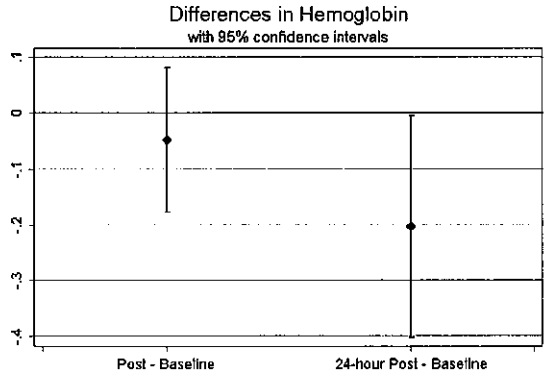


Hemoglobin (g/dL)

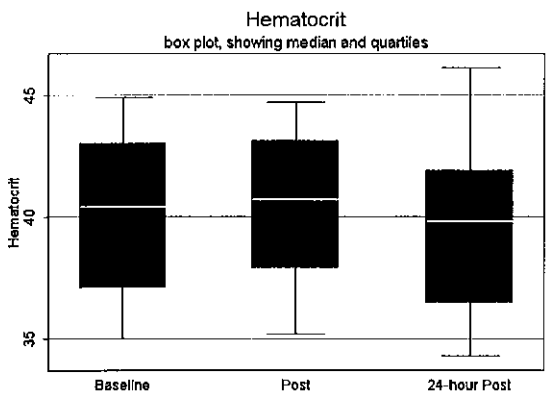


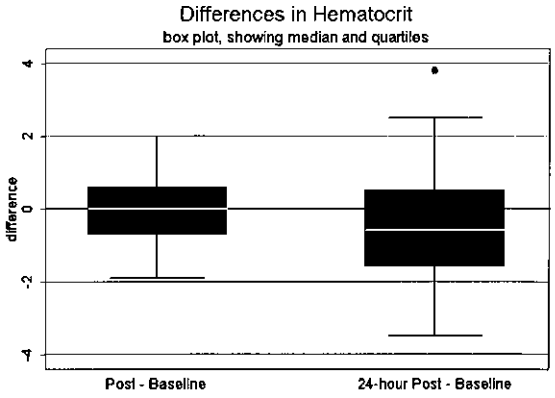


	Baseline	Post	24-Hour Post	Post - Baseline	24 Hour - Baseline
N	29	29	29	29	29
Mean	13.82	13.77	13.62	-0.05	-0.20
Median	13.90	13.90	13.60	-0.10	-0.10
Standard dev.	1.13	1.05	1.04	0.34	0.52
Range	12.00-15.70	12.00-15.30	12.00-15.30	-0.80-0.50	-1.10-0.60
Change 95% Confidence interval				-0.05 (-0.18, 0.08)	-0.20 (-0.40, 0.00)
Percentage Change 95% Confidence interval				-0.28 (-1.20, 0.64)	-1.36 (-2.77, 0.04)
Wilcoxon signed-ranks test of difference: p-value				0.25424	0.03967
Normality test of difference: p-value				0.74816	0.09934
T-test of difference: p-value				0.45334	0.04550
Power of T-test to detect difference of 1/2 SD				100%	
Power of T-test to detect difference of 1 SD				100%	

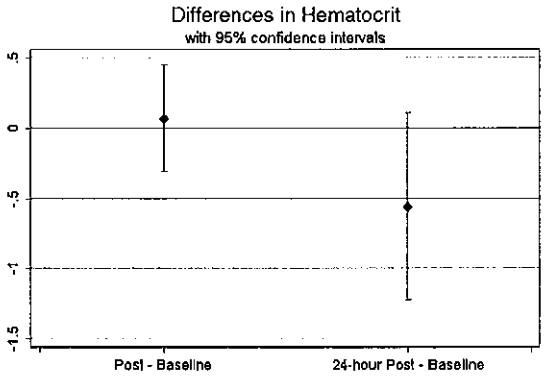


Hematocrit (%)

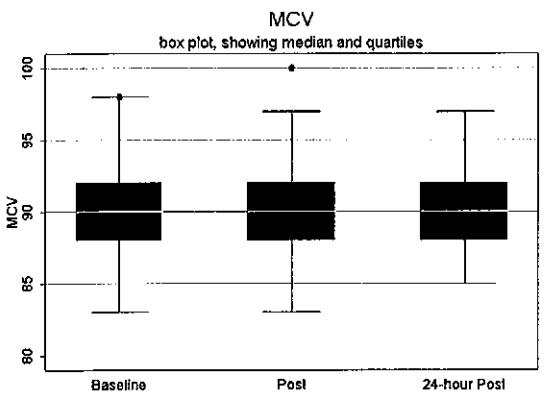


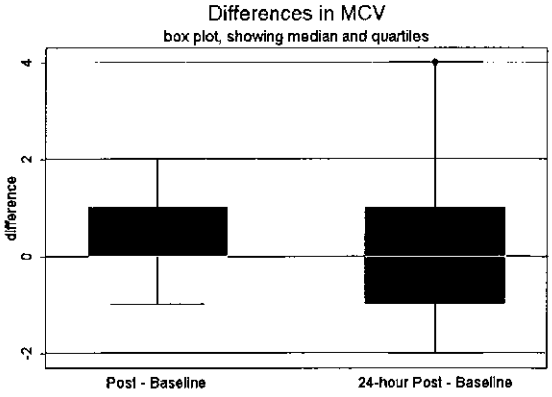


	Baseline	Post	24-Hour Post	Post - Baseline	24 Hour - Baseline
N	29	29	29	29	29
Mean	40.20	40.28	39.64	0.07	-0.56
Median	40.40	40.70	39.80	0.00	-0.60
Standard dev.	3.31	3.03	3.31	1.01	1.76
Range	35.00-44.90	35.20-44.70	34.30-46.10	-1.90-2.00	-3.50-3.80
Change 95% Confidence interval				0.07 (-0.31, 0.46)	-0.56 (-1.23, 0.11)
Percentage Change 95% Confidence interval				0.27 (-0.70, 1.23)	-1.30 (-2.96, 0.35)
Wilcoxon signed-ranks test of difference: p-value				0.43533	0.03717
Normality test of difference: p-value				0.53516	0.74157
T-test of difference: p-value				0.70291	0.09876
Power of T-test to detect difference of 1/2 SD				100%	100%
Power of T-test to detect difference of 1 SD				100%	100%

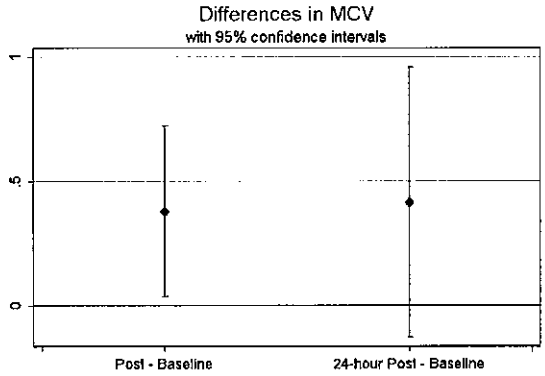


MCV (fL)

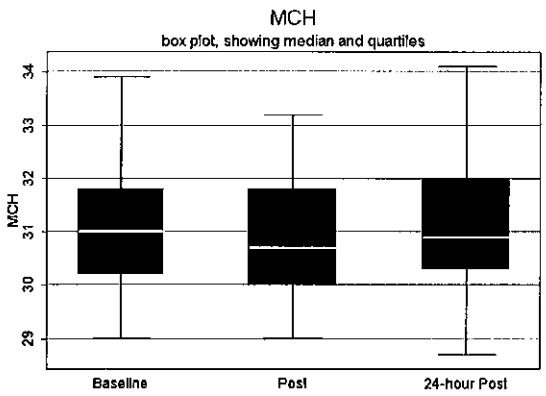


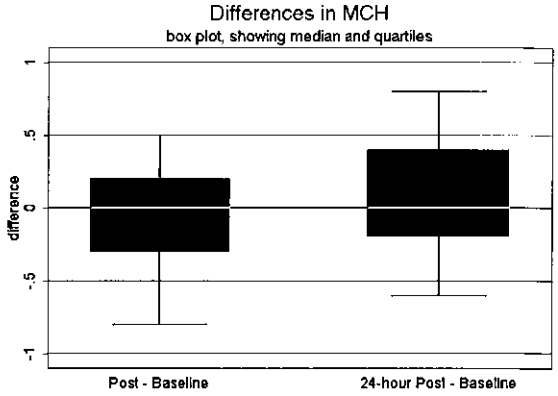


	Baseline	Post	24-Hour Post	Post - Baseline	24 Hour - Baseline
N	29	29	29	29	29
Mean	90.10	90.48	90.52	0.38	0.41
Median	90.00	90.00	90.00	0.00	0.00
Standard dev.	3.76	3.82	3.31	0.90	1.43
Range	83.00-98.00	83.00-100.00	85.00-97.00	-1.00-2.00	-2.00-4.00
Change 95% Confidence interval				0.38 (0.04, 0.72)	0.41 (-0.13, 0.96)
Percentage Change 95% Confidence interval				0.42 (0.05, 0.80)	0.49 (-0.12, 1.10)
Wilcoxon signed-ranks test of difference: p-value				0.02112	0.08903
Normality test of difference: p-value				0.99395	0.65836
T-test of difference: p-value				0.03163	0.12968
Power of T-test to detect difference of 1/2 SD					100%
Power of T-test to detect difference of 1 SD					100%

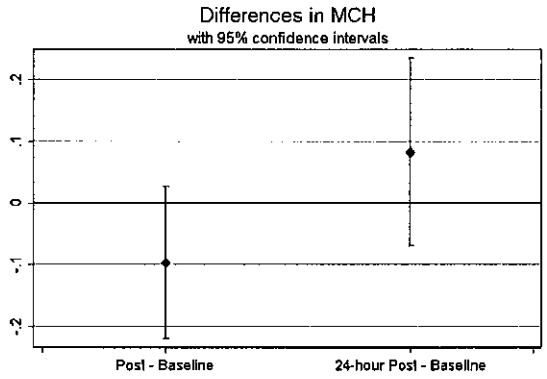


MCH (pg)

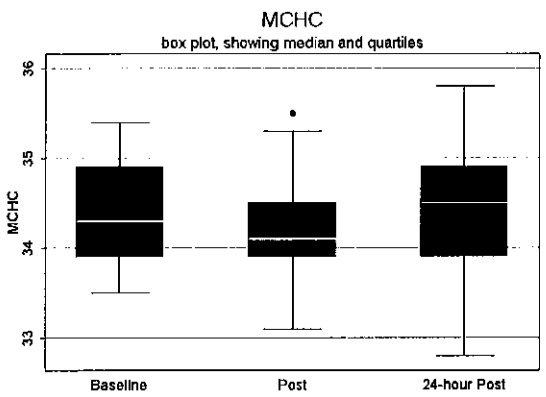


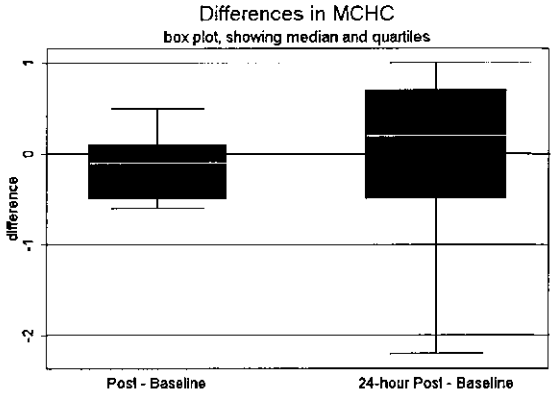


	Baseline	Post	24-Hour Post	Post - Baseline	24 Hour - Baseline
N	29	29	29	29	29
Mean	31.00	30.90	31.08	-0.10	0.08
Median	31.00	30.70	30.90	0.00	0.00
Standard dev.	1.24	1.23	1.35	0.32	0.40
Range	29.00-33.90	29.00-33.20	28.70-34.10	-0.80-0.50	-0.60-0.80
Change 95% Confidence interval				-0.10 (-0.22, 0.03)	0.08 (-0.07, 0.23)
Percentage Change 95% Confidence interval				-0.31 (-0.69, 0.08)	0.26 (-0.22, 0.74)
Wilcoxon signed-ranks test of difference: p-value				0.08185	0.20475
Normality test of difference: p-value				0.91717	0.46602
T-test of difference: p-value				0.12039	0.27370
Power of T-test to detect difference of 1/2 SD				100%	100%
Power of T-test to detect difference of 1 SD				100%	100%

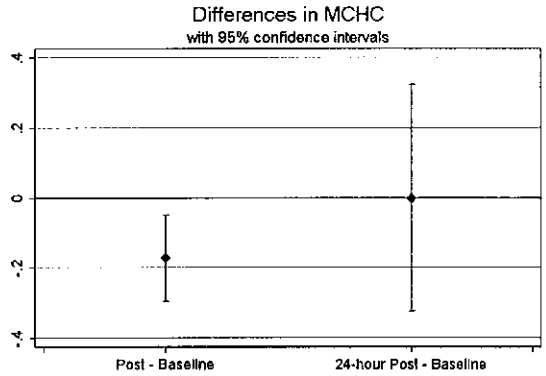


MCHC (g/dL)

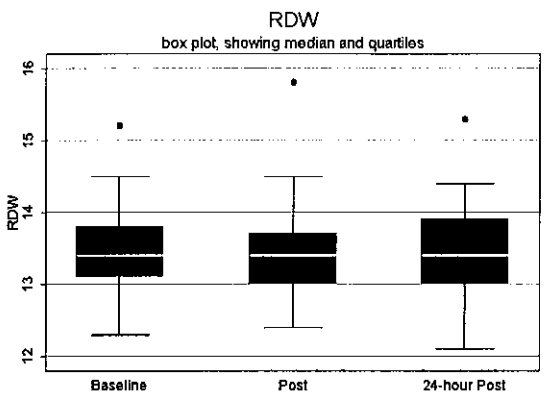


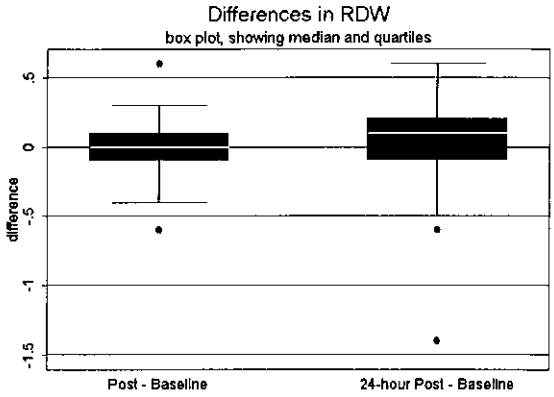


	Baseline	Post	24-Hour Post	Post - Baseline	24 Hour - Baseline
N	29	29	29	29	29
Mean	34.38	34.21	34.38	-0.17	0.00
Median	34.30	34.10	34.50	-0.10	0.20
Standard dev.	0.54	0.57	0.72	0.32	0.85
Range	33.50-35.40	33.10-35.50	32.80-35.80	-0.60-0.50	-2.20-1.00
Change 95% Confidence interval				-0.17 (-0.29, -0.05)	0.00 (-0.32, 0.32)
Percentage Change 95% Confidence interval				-0.50 (-0.85, -0.14)	0.02 (-0.91, 0.96)
Wilcoxon signed-ranks test of difference: p-value				0.00462	0.29427
Normality test of difference: p-value				0.09206	0.03384
T-test of difference: p-value				0.00725	1.00000
Power of T-test to detect difference of 1/2 SD					41%
Power of T-test to detect difference of 1 SD					93%

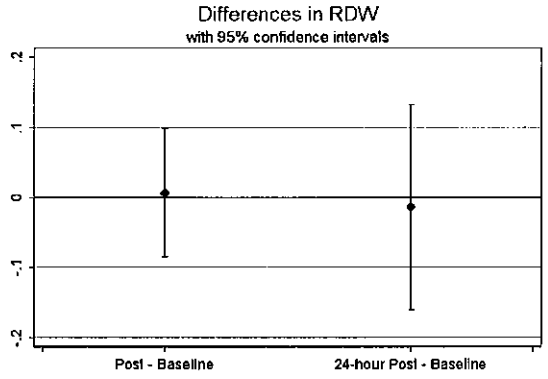


RDW (%)

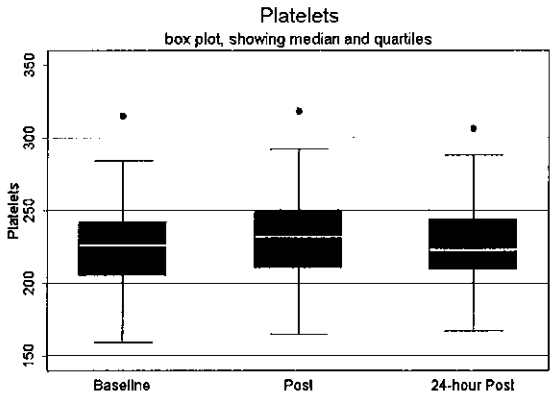


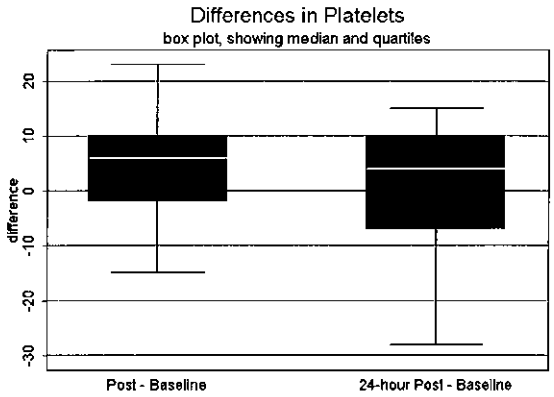


	Baseline	Post	24-Hour Post	Post - Baseline	24 Hour - Baseline
N	29	29	29	29	29
Mean	13.47	13.47	13.45	0.01	-0.01
Median	13.40	13.40	13.40	0.00	0.10
Standard dev.	0.65	0.69	0.68	0.24	0.39
Range	12.30-15.20	12.40-15.80	12.10-15.30	-0.60-0.60	-1.40-0.60
Change 95% Confidence interval				0.01 (-0.09, 0.10)	-0.01 (-0.16, 0.13)
Percentage Change 95% Confidence interval				0.06 (-0.62, 0.73)	-0.07 (-1.16, 1.02)
Wilcoxon signed-ranks test of difference: p-value				0.46102	0.37243
Normality test of difference: p-value				0.79562	0.00419
T-test of difference: p-value				0.87909	0.84848
Power of T-test to detect difference of 1/2 SD				100%	100%
Power of T-test to detect difference of 1 SD				100%	100%

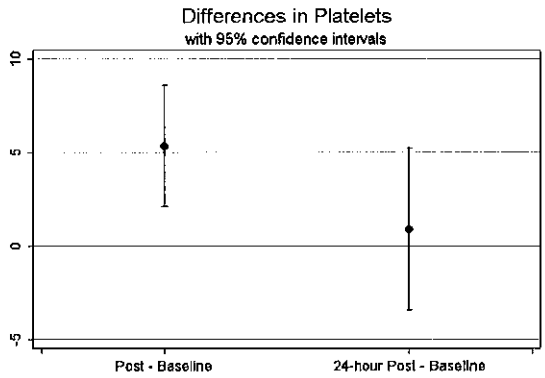


Platelets (x10E3/uL)

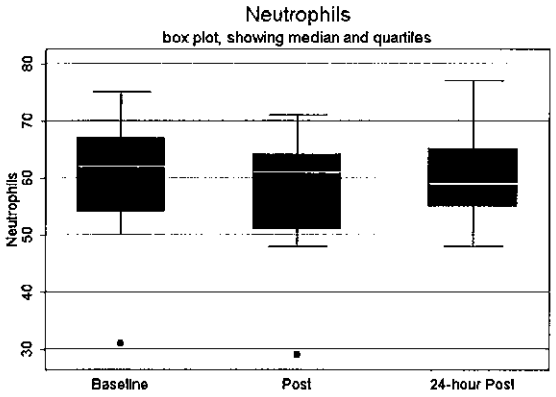


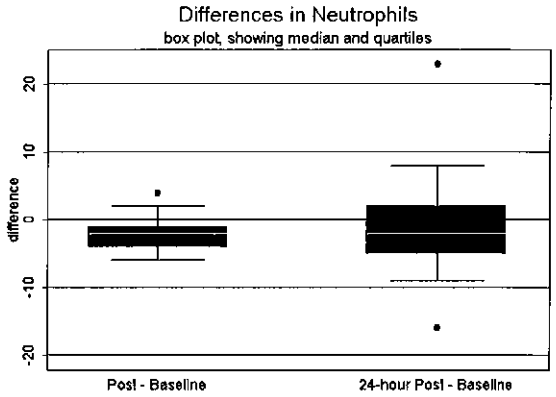


	Baseline	Post	24-Hour Post	Post - Baseline	24 Hour - Baseline
N	29	29	29	29	29
Mean	226.07	231.45	226.97	5.38	0.90
Median	226.00	232.00	223.00	6.00	4.00
Standard dev.	33.52	34.56	32.01	8.49	11.38
Range	159-315	165-318	167-306	-15.00-23.00	-28.00-15.00
Change 95% Confidence interval				5.38 (2.15, 8.61)	0.90 (-3.43, 5.23)
Percentage Change 95% Confidence interval				2.42 (0.97, 3.88)	0.63 (-1.34, 2.60)
Wilcoxon signed-ranks test of difference: p-value				0.00102	0.25113
Normality test of difference: p-value				0.97290	0.10834
T-test of difference: p-value				0.00198	0.67473
Power of T-test to detect difference of 1/2 SD					100%
Power of T-test to detect difference of 1 SD					100%

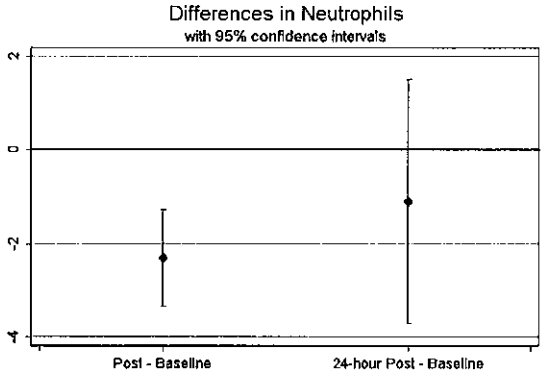


Neutrophils (%)

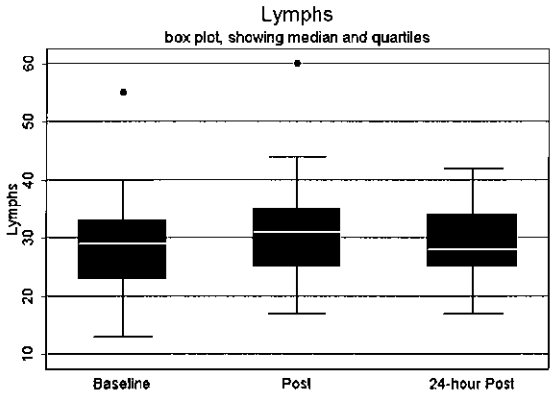


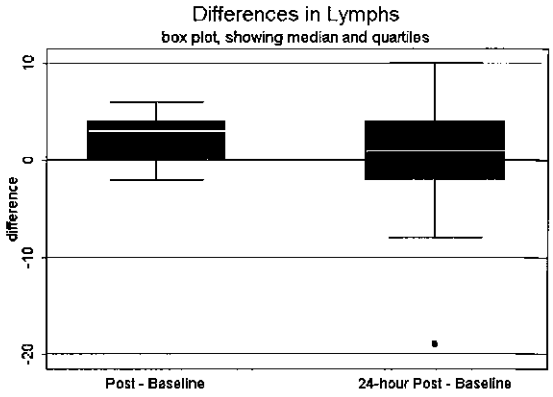


	Baseline	Post	24-Hour Post	Post - Baseline	24 Hour - Baseline
N	29	29	29	29	29
Mean	60.72	58.41	59.62	-2.31	-1.10
Median	62.00	61.00	59.00	-2.00	-2.00
Standard dev.	8.70	9.04	7.23	2.74	6.87
Range	31.00-75.00	29.00-71.00	48.00-77.00	-6.00-4.00	-16.00-23.00
Change 95% Confidence interval				-2.31 (-3.35, -1.27)	-1.10 (-3.72, 1.51)
Percentage Change 95% Confidence interval				-3.89 (-5.57, -2.21)	-0.33 (-6.53, 5.87)
Wilcoxon signed-ranks test of difference: p-value				0.00018	0.05924
Normality test of difference: p-value				0.25557	0.01092
T-test of difference: p-value				0.00010	0.39427
Power of T-test to detect difference of 1/2 SD					93%
Power of T-test to detect difference of 1 SD					100%

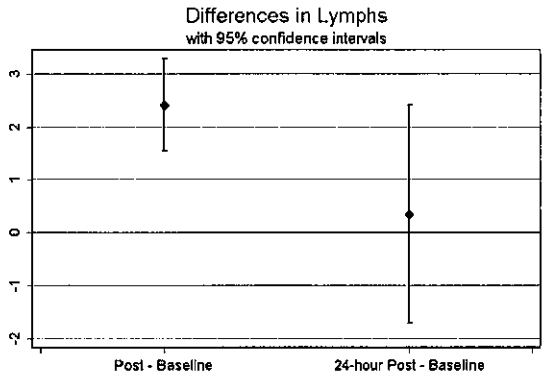


Lymphs (%)

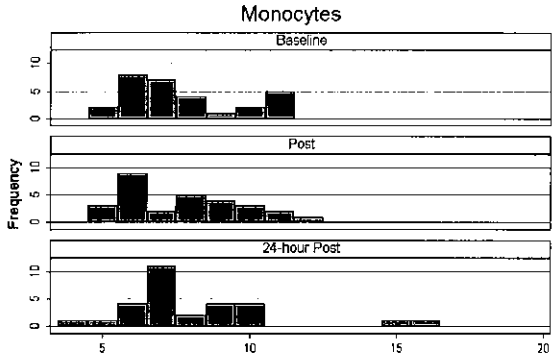


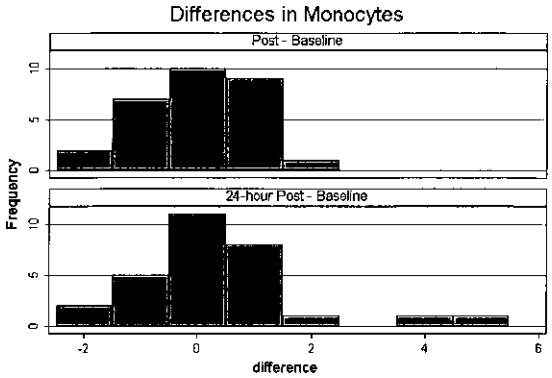


	Baseline	Post	24-Hour Post	Post - Baseline	24 Hour - Baseline
N	29	29	29	29	29
Mean	28.79	31.21	29.14	2.41	0.34
Median	29.00	31.00	28.00	3.00	1.00
Standard dev.	8.13	8.85	6.50	2.29	5.41
Range	13.00-55.00	17.00-60.00	17.00-42.00	-2.00-6.00	-19.00-10.00
Change 95% Confidence interval				2.41 (1.54, 3.29)	0.34 (-1.71, 2.40)
Percentage Change 95% Confidence interval				8.91 (5.09, 12.73)	4.29 (-3.53, 12.11)
Wilcoxon signed-ranks test of difference: p-value				0.00005	0.16723
Normality test of difference: p-value				0.04694	0.00792
T-test of difference: p-value				0.00000	0.73414
Power of T-test to detect difference of 1/2 SD					98%
Power of T-test to detect difference of 1 SD					100%

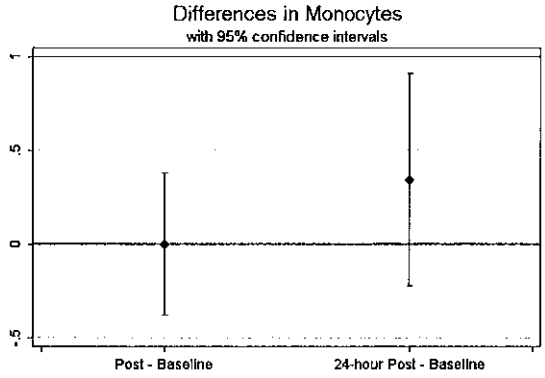


Monocytes (%)

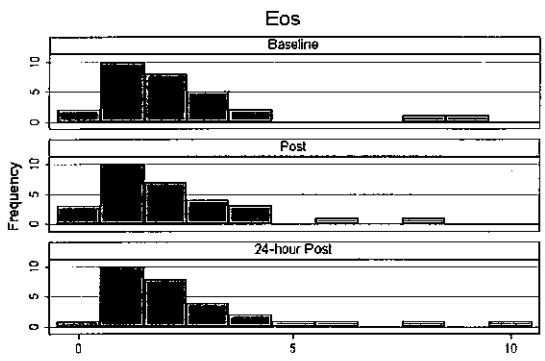


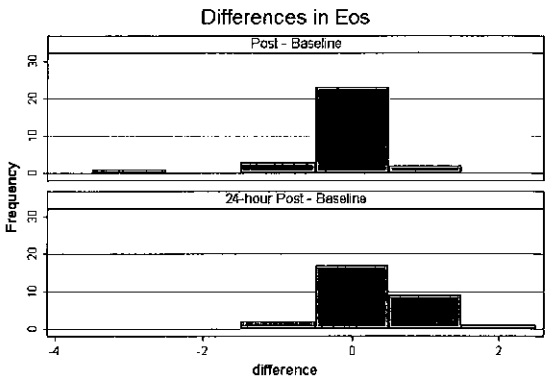


	Baseline	Post	24-Hour Post	Post - Baseline	24 Hour - Baseline
N	29	29	29	29	29
Mean	7.69	7.69	8.03	0.00	0.34
Median	7.00	8.00	7.00	0.00	0.00
Standard dev.	1.97	2.00	2.57	1.00	1.49
Range	5.00-11.00	5.00-12.00	4.00-16.00	-2.00-2.00	-2.00-5.00
Change 95% Confidence interval				0.00 (-0.38, 0.38)	0.34 (-0.22, 0.91)
Percentage Change 95% Confidence interval				0.60 (-4.33, 5.53)	4.38 (-1.72, 10.47)
Wilcoxon signed-ranks test of difference: p-value				0.45949	0.16892

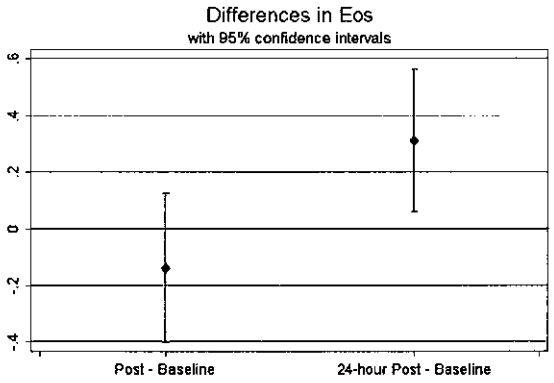


Eos (%)

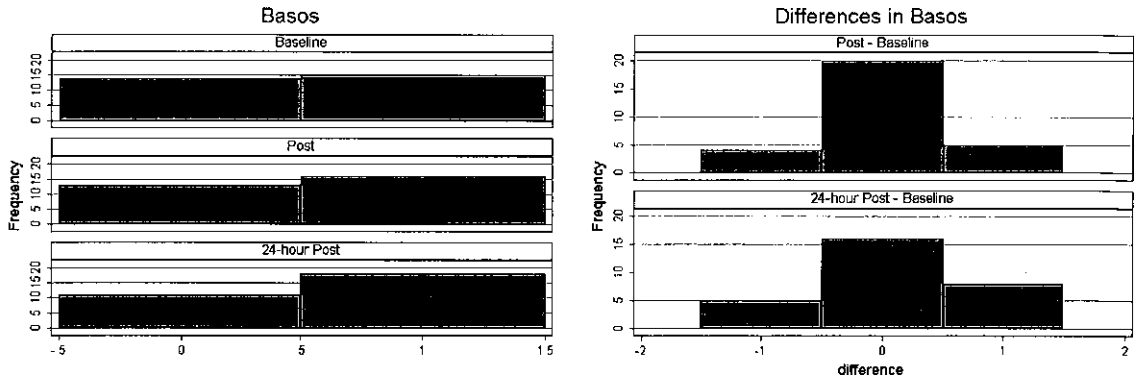




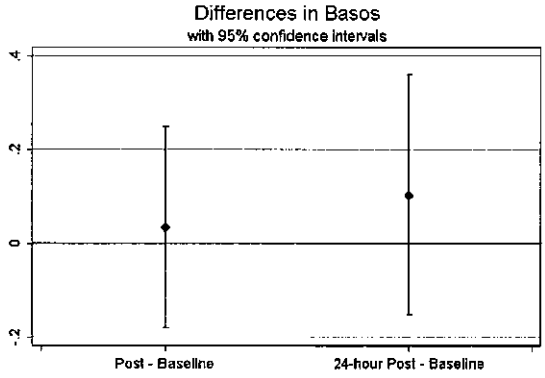
	Baseline	Post	24-Hour Post	Post - Baseline	24 Hour - Baseline
N	29	29	29	29	29
Mean	2.28	2.14	2.59	-0.14	0.31
Median	2.00	2.00	2.00	0.00	0.00
Standard dev.	2.02	1.79	2.24	0.69	0.66
Range	0.00-9.00	0.00-8.00	0.00-10.00	-3.00-1.00	-1.00-2.00
Change 95% Confidence interval				-0.14 (-0.40, 0.13)	0.31 (0.06, 0.56)
Percentage Change 95% Confidence interval				-3.70 (-16.42, 9.01)	14.92 (0.00, 29.83)
Wilcoxon signed-ranks test of difference: p-value				0.19862	0.00995



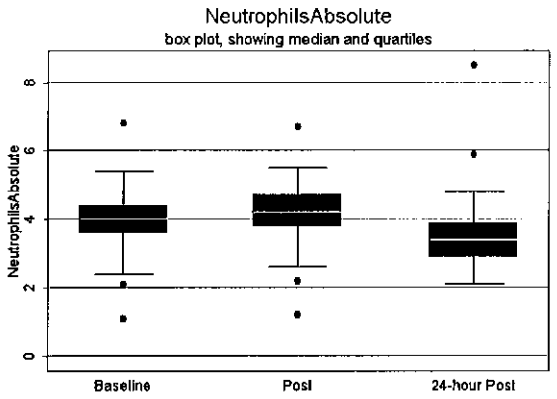
Basos (%)

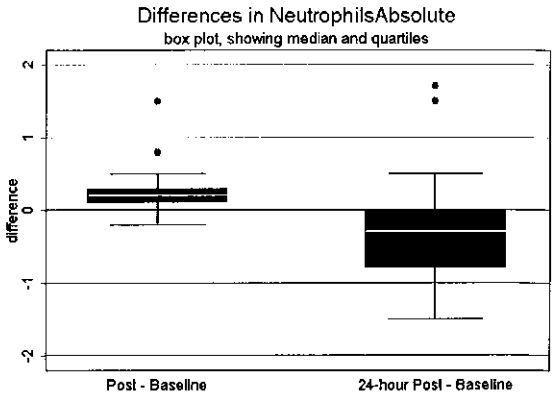


	Baseline	Post	24-Hour Post	Post - Baseline	24 Hour - Baseline
N	29	29	29	29	29
Mean	0.52	0.55	0.62	0.03	0.10
Median	1.00	1.00	1.00	0.00	0.00
Standard dev.	0.51	0.51	0.49	0.57	0.67
Range	0.00-1.00	0.00-1.00	0.00-1.00	-1.00-1.00	-1.00-1.00
Change 95% Confidence interval				0.03 (-0.18, 0.25)	0.10 (-0.15, 0.36)
Percentage Change 95% Confidence interval				-26.67 (-52.02, -1.32)	-33.33 (-60.36, -6.31)
Wilcoxon signed-ranks test of difference: p-value				0.36944	0.20269

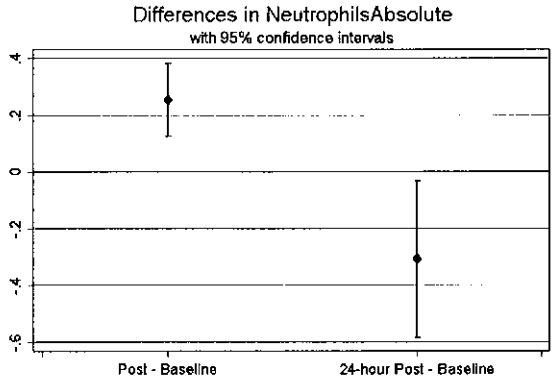


Neutrophils Absolute (x10E3/uL)

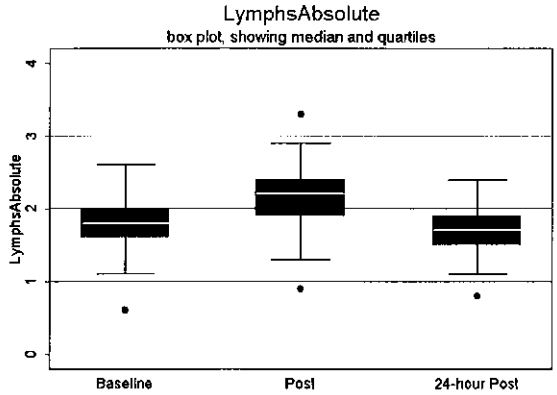


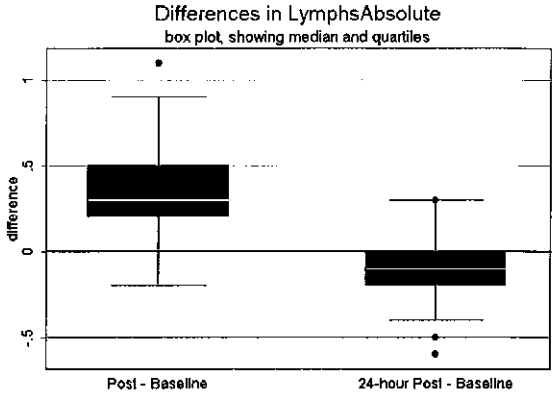


	Baseline	Post	24-Hour Post	Post - Baseline	24 Hour - Baseline
N	29	29	29	29	29
Mean	3.91	4.17	3.60	0.26	-0.31
Median	4.00	4.20	3.40	0.20	-0.30
Standard dev.	1.07	1.13	1.28	0.34	0.73
Range	1.10-6.80	1.20-6.70	2.10-8.50	-0.20-1.50	-1.50-1.70
Change 95% Confidence interval				0.26 (0.13, 0.38)	-0.31 (-0.58, -0.03)
Percentage Change 95% Confidence interval				6.85 (3.64, 10.06)	-5.07 (-16.70, 6.56)
Wilcoxon signed-ranks test of difference: p-value				0.00006	0.00552
Normality test of difference: p-value				0.00029	0.04047
T-test of difference: p-value				0.00034	0.03108

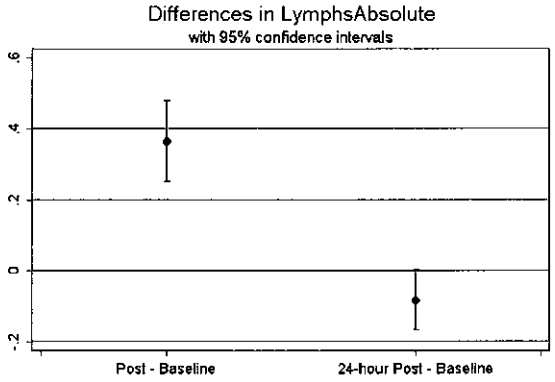


Lymphs Absolute (x10E3/uL)

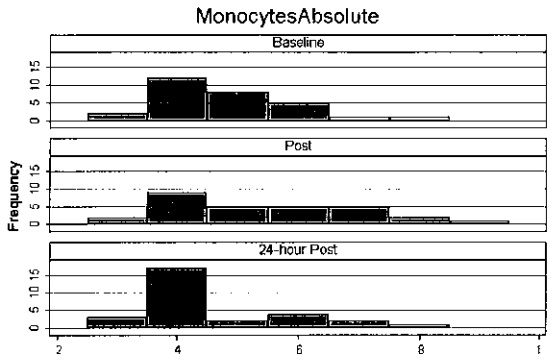


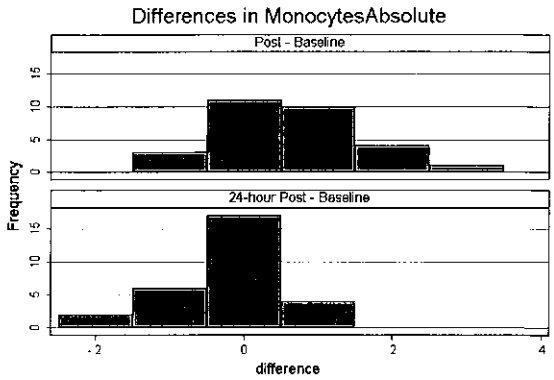


	Baseline	Post	24-Hour Post	Post - Baseline	24 Hour - Baseline
N	29	29	29	29	29
Mean	1.78	2.14	1.69	0.37	-0.08
Median	1.80	2.20	1.70	0.30	-0.10
Standard dev.	0.44	0.51	0.37	0.30	0.23
Range	0.60-2.60	0.90-3.30	0.80-2.40	-0.20-1.10	-0.60-0.30
Change 95% Confidence interval				0.37 (0.25, 0.48)	-0.08 (-0.17, 0.00)
Percentage Change 95% Confidence interval				22.77 (15.24, 30.29)	-2.84 (-7.74, 2.07)
Wilcoxon signed-ranks test of difference: p-value				0.00000	0.04858
Normality test of difference: p-value				0.76408	0.68693
T-test of difference: p-value				0.00000	0.05784
Power of T-test to detect difference of 1/2 SD					100%
Power of T-test to detect difference of 1 SD					100%

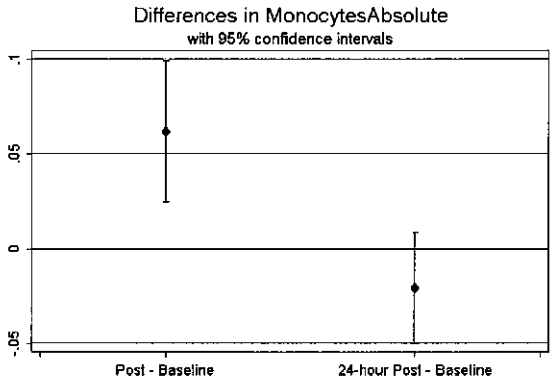


Monocytes Absolute (x10E3/uL)

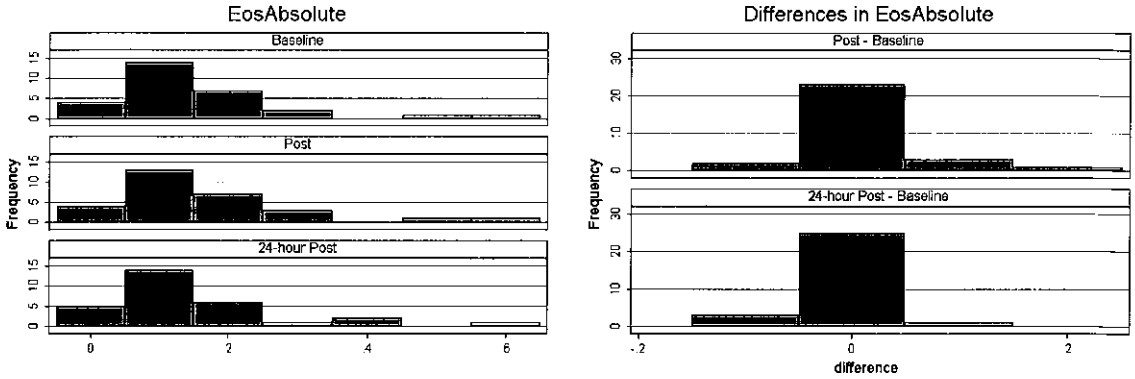




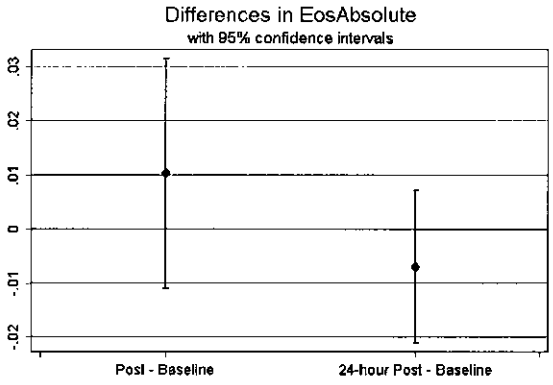
	Baseline	Post	24-Hour Post	Post - Baseline	24 Hour - Baseline
N	29	29	29	29	29
Mean	0.48	0.54	0.46	0.06	-0.02
Median	0.50	0.50	0.40	0.10	0.00
Standard dev.	0.11	0.16	0.13	0.10	0.08
Range	0.30-0.80	0.30-0.90	0.30-0.80	-0.10-0.30	-0.20-0.10
Change 95% Confidence interval				0.06 (0.02, 0.10)	-0.02 (-0.05, 0.01)
Percentage Change 95% Confidence interval				12.94 (4.96, 20.91)	-3.90 (-9.21, 1.40)
Wilcoxon signed-ranks test of difference: p-value				0.00236	0.12890



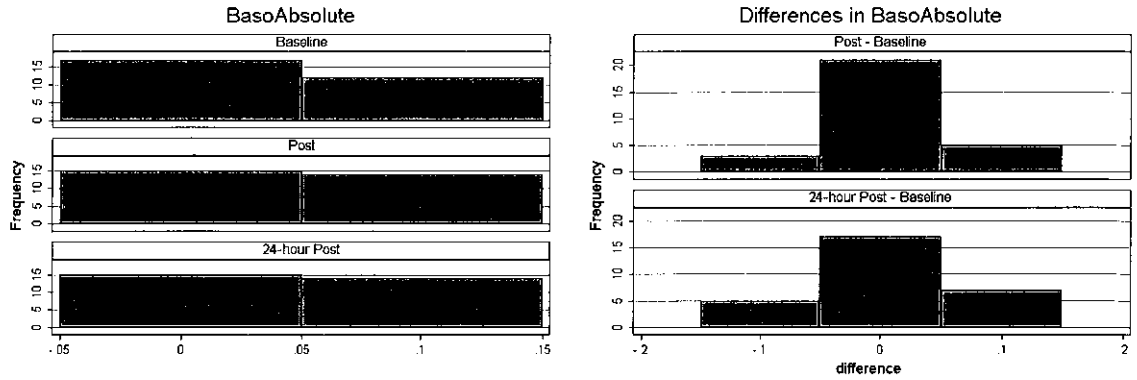
Eos Absolute (x10E3/uL)



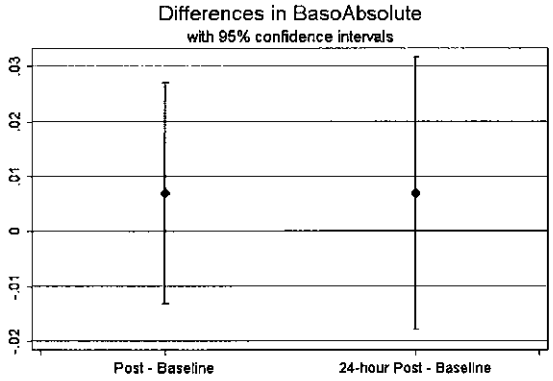
	Baseline	Post	24-Hour Post	Post - Baseline	24 Hour - Baseline
N	29	29	29	29	29
Mean	0.16	0.17	0.15	0.01	-0.01
Median	0.10	0.10	0.10	0.00	0.00
Standard dev.	0.14	0.15	0.14	0.06	0.04
Range	0.00-0.60	0.00-0.70	0.00-0.60	-0.10-0.20	-0.10-0.10
Change 95% Confidence interval				0.01 (-0.01, 0.03)	-0.01 (-0.02, 0.01)
Percentage Change 95% Confidence interval				2.93 (-10.16, 16.03)	-5.47 (-15.17, 4.24)
Wilcoxon signed-ranks test of difference: p-value				0.20754	0.15018



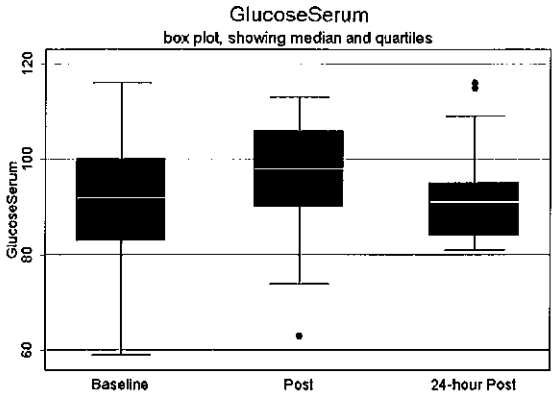
Baso Absolute (x10E3/uL)

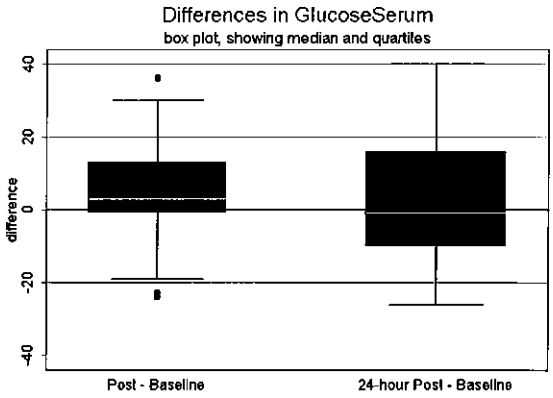


	Baseline	Post	24-Hour Post	Post - Baseline	24 Hour - Baseline
N	29	29	29	29	29
Mean	0.04	0.05	0.05	0.01	0.01
Median	0.00	0.00	0.00	0.00	0.00
Standard dev.	0.05	0.05	0.05	0.05	0.07
Range	0.00-0.10	0.00-0.10	0.00-0.10	-0.10-0.10	-0.10-0.10
Change 95% Confidence interval				0.01 (-0.01, 0.03)	0.01 (-0.02, 0.03)
Percentage Change 95% Confidence interval				-25.00 (-53.74, 3.74)	-41.67 (-74.38, -8.95)
Wilcoxon signed-ranks test of difference: p-value				0.23975	0.28185

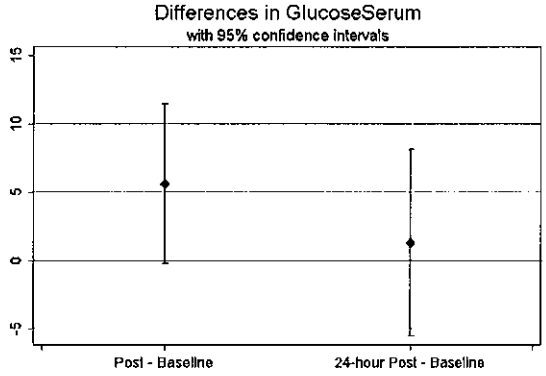


Glucose Serum (mg/dL)

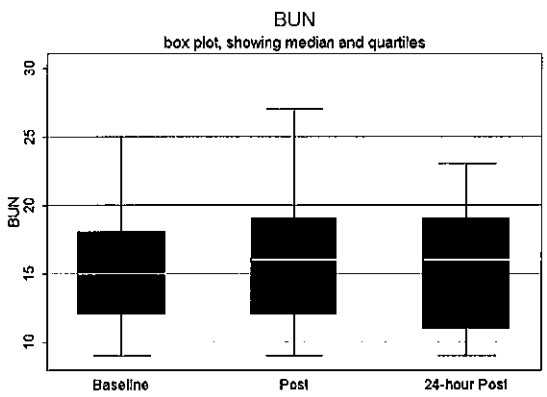


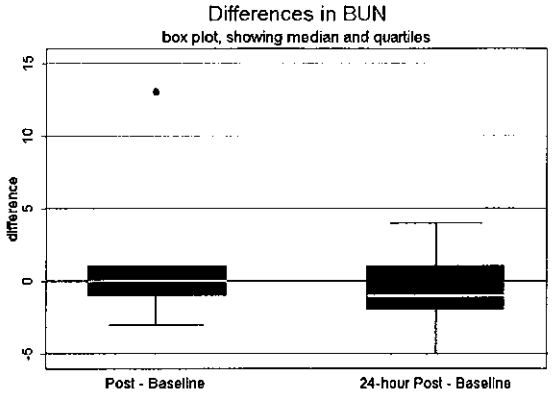


	Baseline	Post	24-Hour Post	Post - Baseline	24 Hour - Baseline
N	29	29	29	29	29
Mean	90.17	95.79	91.48	5.62	1.31
Median	92.00	98.00	91.00	3.00	-1.00
Standard dev.	14.93	12.04	9.39	15.35	17.96
Range	59-116	63-113	81-116	-24.00-36.00	-26.00-40.00
Change 95% Confidence interval				5.62 (-0.22, 11.46)	1.31 (-5.52, 8.14)
Percentage Change 95% Confidence interval				8.46 (1.21, 15.70)	4.66 (-4.06, 13.39)
Wilcoxon signed-ranks test of difference: p-value				0.02319	0.46123
Normality test of difference: p-value				0.43975	0.29046
T-test of difference: p-value				0.05857	0.69744
Power of T-test to detect difference of 1/2 SD				75%	61%
Power of T-test to detect difference of 1 SD				100%	99%

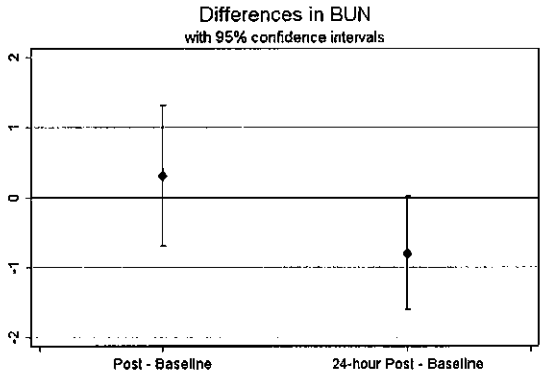


BUN (mg/dL)

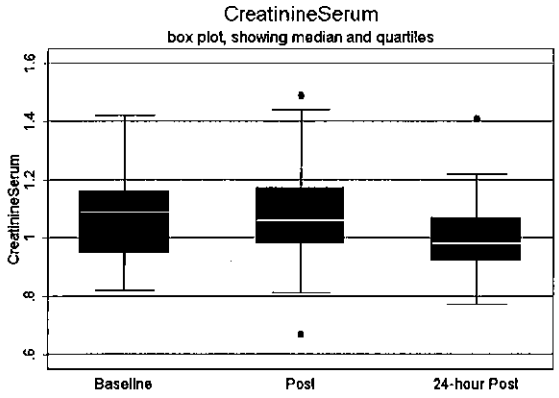


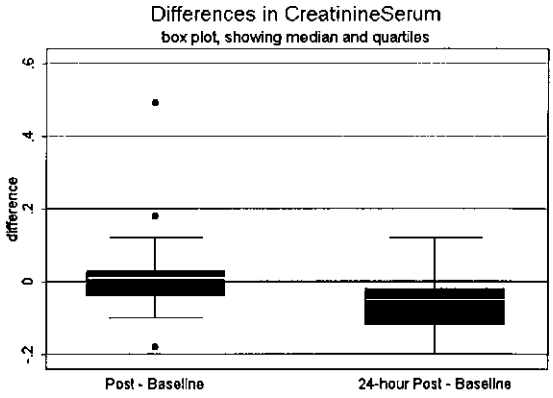


	Baseline	Post	24-Hour Post	Post - Baseline	24 Hour - Baseline
N	29	29	29	29	29
Mean	16.03	16.34	15.24	0.31	-0.79
Median	15.00	16.00	16.00	0.00	-1.00
Standard dev.	4.45	5.00	4.13	2.65	2.14
Range	9.00-25.00	9.00-27.00	9.00-23.00	-3.00-13.00	-5.00-4.00
Change 95% Confidence interval				0.31 (-0.70, 1.32)	-0.79 (-1.61, 0.02)
Percentage Change 95% Confidence interval				2.25 (-4.98, 9.47)	-4.15 (-9.05, 0.75)
Wilcoxon signed-ranks test of difference: p-value				0.47731	0.02984
Normality test of difference: p-value				0.00000	0.99974
T-test of difference: p-value				0.53294	0.05624
Power of T-test to detect difference of 1/2 SD				99%	100%
Power of T-test to detect difference of 1 SD				100%	100%

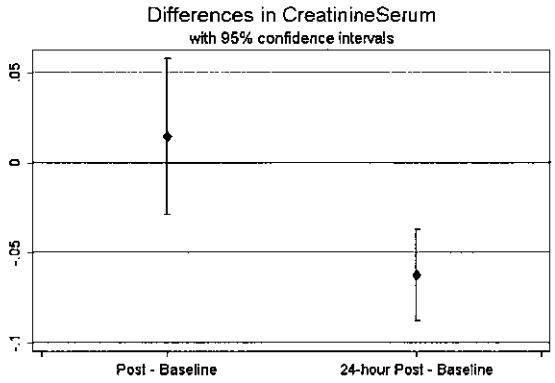


Creatinine Serum (mg/dL)

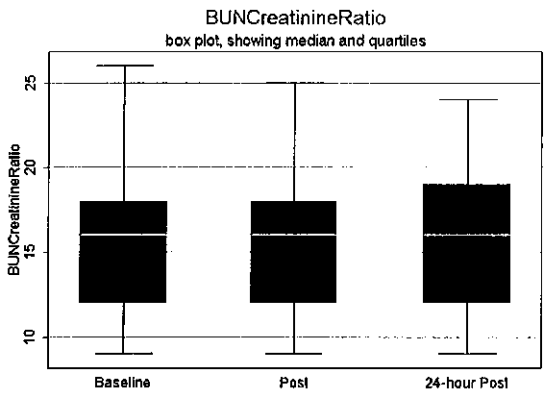


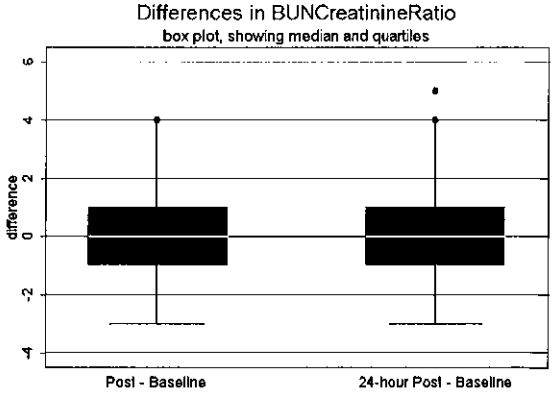


	Baseline	Post	24-Hour Post	Post - Baseline	24 Hour - Baseline
N	29	29	29	29	29
Mean	1.06	1.07	1.00	0.01	-0.06
Median	1.09	1.06	0.98	0.01	-0.05
Standard dev.	0.15	0.18	0.14	0.11	0.07
Range	0.82-1.42	0.67-1.49	0.77-1.41	-0.18-0.49	-0.20-0.12
Change 95% Confidence interval				0.01 (-0.03, 0.06)	-0.06 (-0.09, -0.04)
Percentage Change 95% Confidence interval				1.52 (-3.07, 6.11)	-5.65 (-8.07, -3.24)
Wilcoxon signed-ranks test of difference: p-value				0.41426	0.00003
Normality test of difference: p-value				0.00001	0.42936
T-test of difference: p-value				0.49894	0.00003
Power of T-test to detect difference of 1/2 SD				93%	
Power of T-test to detect difference of 1 SD				100%	

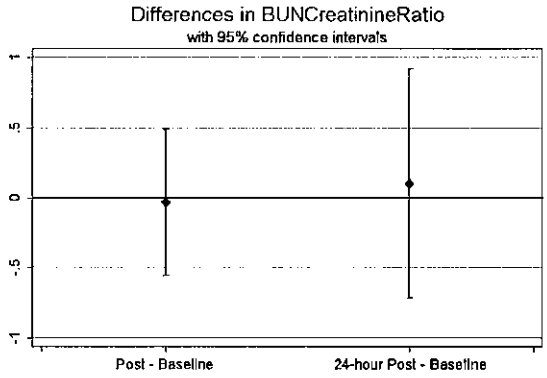


BUN Creatinine Ratio

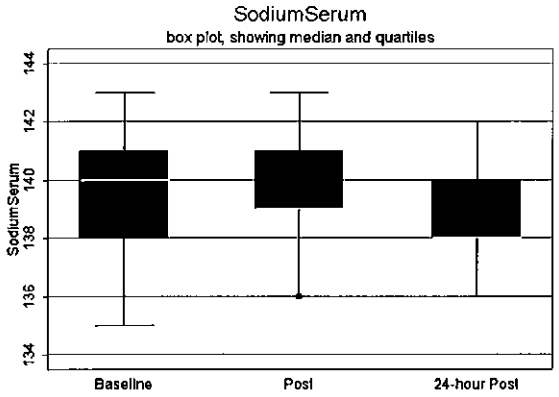


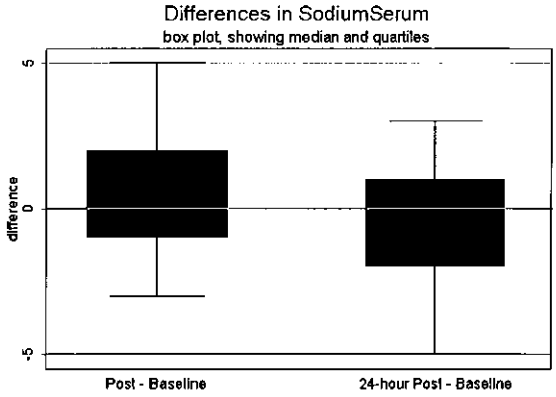


	Baseline	Post	24-Hour Post	Post - Baseline	24 Hour - Baseline
N	29	29	29	29	29
Mean	15.38	15.34	15.48	-0.03	0.10
Median	16.00	16.00	16.00	0.00	0.00
Standard dev.	4.35	4.18	4.38	1.38	2.14
Range	9.00-26.00	9.00-25.00	9.00-24.00	-3.00-4.00	-3.00-5.00
Change 95% Confidence interval				-0.03 (-0.56, 0.49)	0.10 (-0.71, 0.92)
Percentage Change 95% Confidence interval				0.30 (-3.15, 3.74)	1.40 (-3.94, 6.74)
Wilcoxon signed-ranks test of difference: p-value				0.43300	0.49564
Normality test of difference: p-value				0.74730	0.38439
T-test of difference: p-value				0.89357	0.79688
Power of T-test to detect difference of 1/2 SD				100%	100%
Power of T-test to detect difference of 1 SD				100%	100%

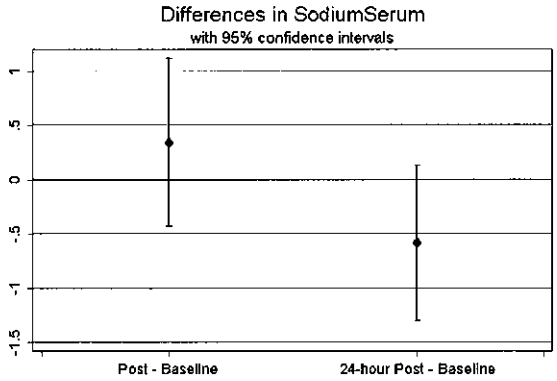


Sodium Serum (mmol/L)

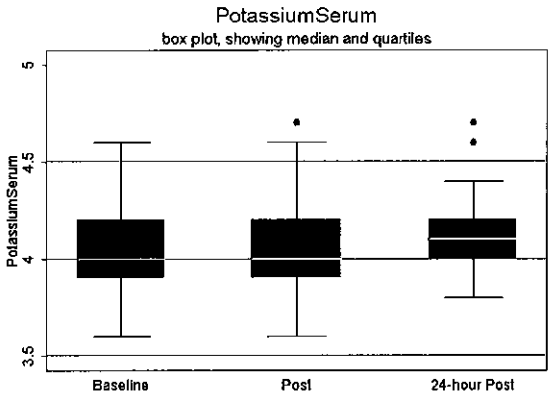


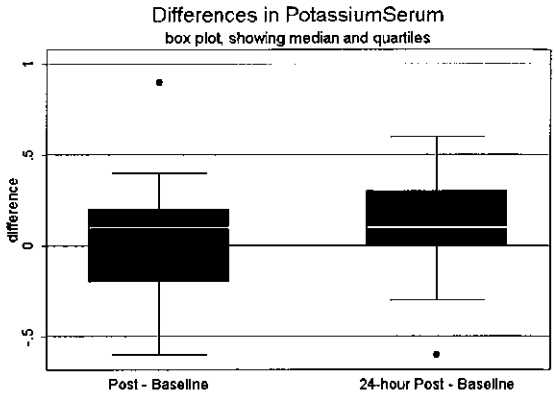


	Baseline	Post	24-Hour Post	Post - Baseline	24 Hour - Baseline
N	29	29	29	29	29
Mean	139.31	139.66	138.72	0.34	-0.59
Median	140.00	139.00	138.00	0.00	0.00
Standard dev.	1.95	2.04	1.51	2.04	1.88
Range	135-143	136-143	136-142	-3.00-5.00	-5.00-3.00
Change 95% Confidence interval				0.34 (-0.43, 1.12)	-0.59 (-1.30, 0.13)
Percentage Change 95% Confidence interval				0.26 (-0.30, 0.82)	-0.41 (-0.92, 0.10)
Wilcoxon signed-ranks test of difference: p-value				0.21210	0.06860
Normality test of difference: p-value				0.81057	0.92955
T-test of difference: p-value				0.37050	0.10437
Power of T-test to detect difference of 1/2 SD				73%	80%
Power of T-test to detect difference of 1 SD				100%	100%

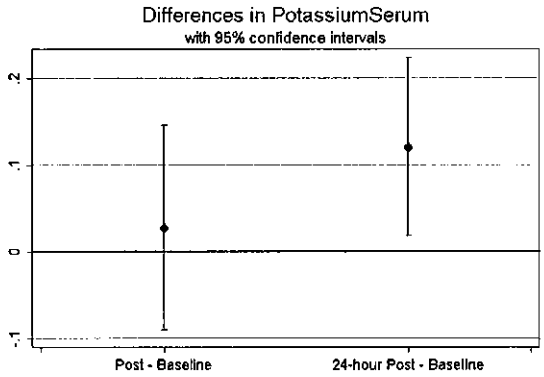


Potassium Serum (mmol/L)

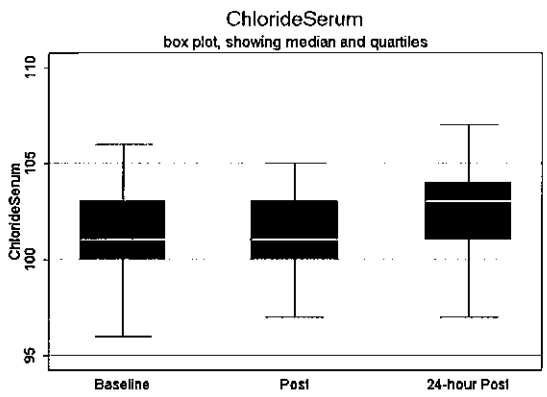


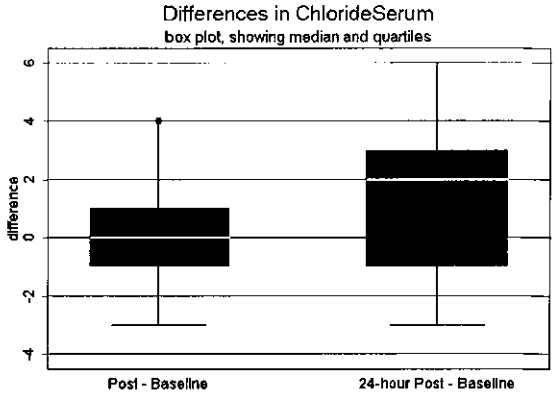


	Baseline	Post	24-Hour Post	Post - Baseline	24 Hour - Baseline
N	29	29	29	29	29
Mean	4.02	4.05	4.14	0.03	0.12
Median	4.00	4.00	4.10	0.10	0.10
Standard dev.	0.22	0.27	0.20	0.31	0.27
Range	3.60-4.60	3.60-4.70	3.80-4.70	-0.60-0.90	-0.60-0.60
Change 95% Confidence interval				0.03 (-0.09, 0.15)	0.12 (0.02, 0.22)
Percentage Change 95% Confidence interval				0.92 (-2.04, 3.87)	3.26 (0.71, 5.80)
Wilcoxon signed-ranks test of difference: p-value				0.29397	0.00883
Normality test of difference: p-value				0.34547	0.60397
T-test of difference: p-value				0.63595	0.02250
Power of T-test to detect difference of 1/2 SD				49%	
Power of T-test to detect difference of 1 SD				97%	

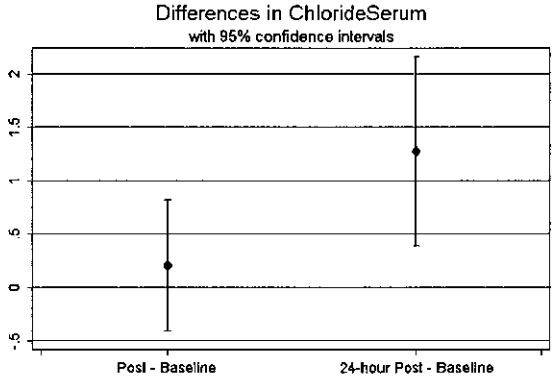


Chloride Serum (mmol/L)

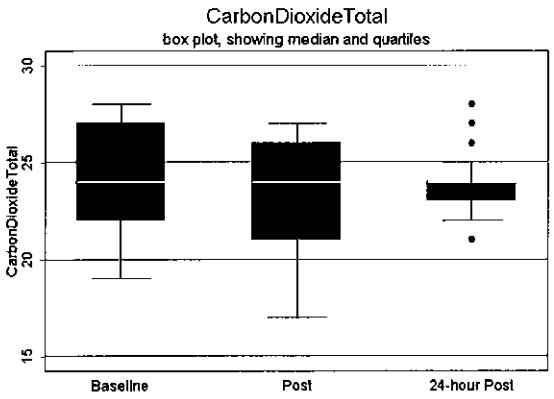


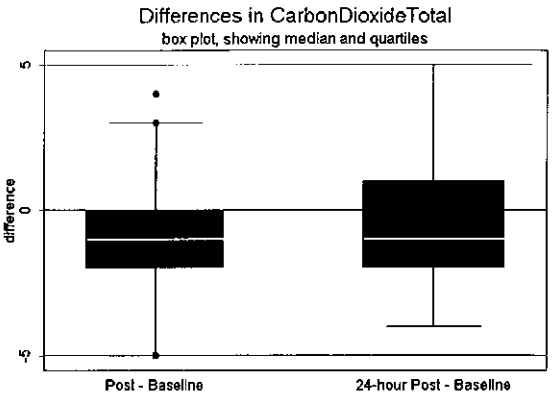


	Baseline	Post	24-Hour Post	Post - Baseline	24 Hour - Baseline
N	29	29	29	29	29
Mean	101.17	101.38	102.45	0.21	1.28
Median	101.00	101.00	103.00	0.00	2.00
Standard dev.	2.30	1.90	2.52	1.61	2.33
Range	96-106	97-105	97-107	-3.00-4.00	-3.00-6.00
Change 95% Confidence interval				0.21 (-0.41, 0.82)	1.28 (0.39, 2.16)
Percentage Change 95% Confidence interval				0.22 (-0.38, 0.83)	1.28 (0.40, 2.17)
Wilcoxon signed-ranks test of difference: p-value				0.24300	0.00377
Normality test of difference: p-value				0.99762	0.72351
T-test of difference: p-value				0.49515	0.00634
Power of T-test to detect difference of 1/2 SD				97%	
Power of T-test to detect difference of 1 SD				100%	

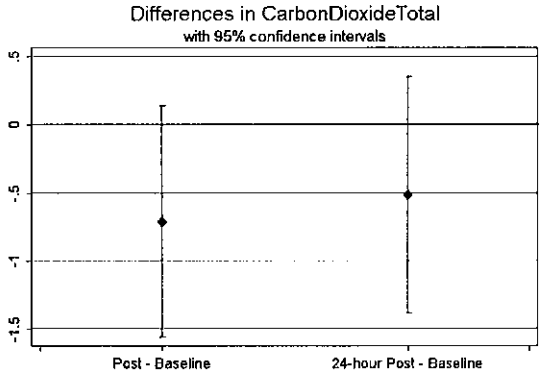


Carbon Dioxide Total (mmol/L)

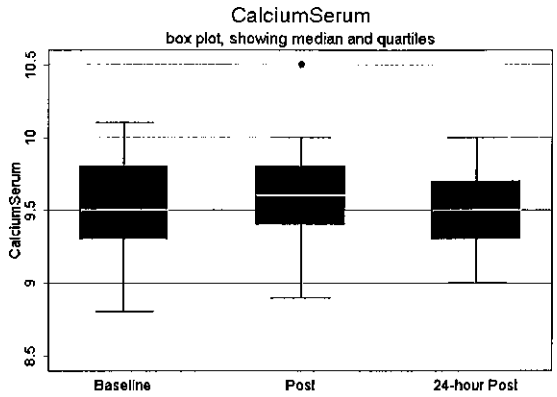


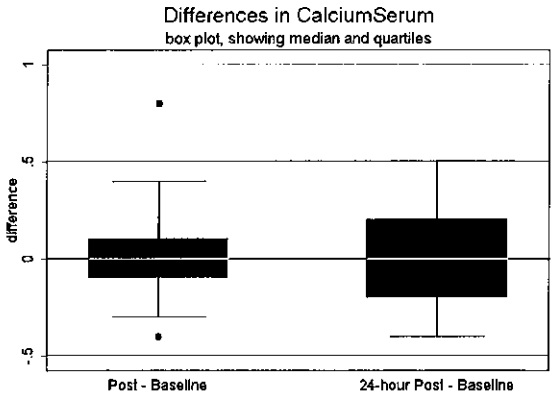


	Baseline	Post	24-Hour Post	Post - Baseline	24 Hour - Baseline
N	31	31	31	31	31
Mean	24.23	23.52	23.71	-0.71	-0.52
Median	24.00	24.00	24.00	-1.00	-1.00
Standard dev.	2.64	2.59	1.70	2.31	2.36
Range	19.00-28.00	17.00-27.00	21.00-28.00	-5.00-4.00	-4.00-5.00
Change 95% Confidence interval				-0.71 (-1.56, 0.14)	-0.52 (-1.38, 0.35)
Percentage Change 95% Confidence interval				-2.47 (-6.11, 1.16)	-1.28 (-5.10, 2.55)
Wilcoxon signed-ranks test of difference: p-value				0.03199	0.08666
Normality test of difference: p-value				0.80796	0.17226
T-test of difference: p-value				0.09780	0.23373
Power of T-test to detect difference of 1/2 SD				89%	88%
Power of T-test to detect difference of 1 SD				100%	100%

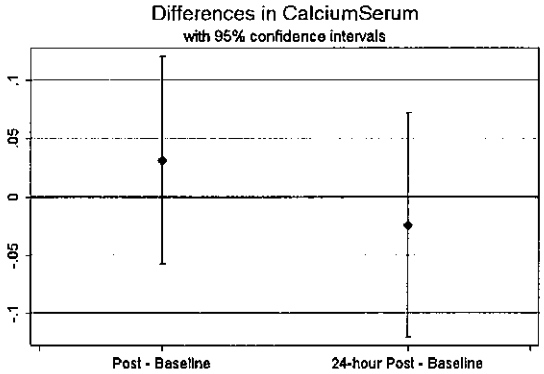


Calcium Serum (mg/dL)

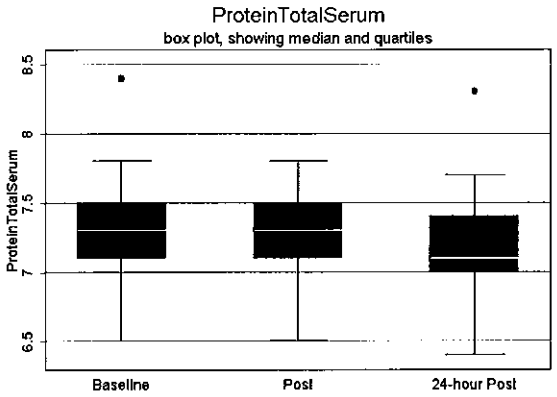


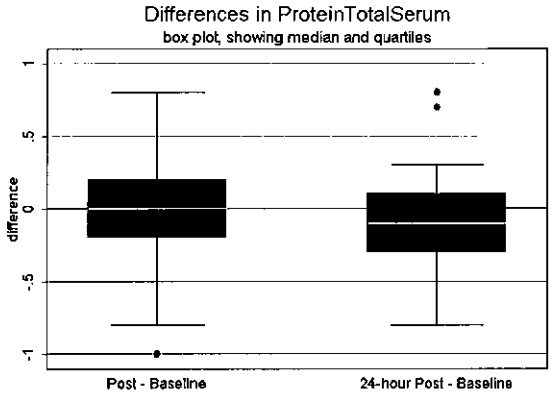


	Baseline	Post	24-Hour Post	Post - Baseline	24 Hour - Baseline
N	29	29	29	29	29
Mean	9.52	9.56	9.50	0.03	-0.02
Median	9.50	9.60	9.50	0.00	0.00
Standard dev.	0.34	0.35	0.28	0.23	0.25
Range	8.80-10.10	8.90-10.50	9.00-10.00	-0.40-0.80	-0.40-0.50
Change 95% Confidence interval				0.03 (-0.06, 0.12)	-0.02 (-0.12, 0.07)
Percentage Change 95% Confidence interval				0.35 (-0.58, 1.28)	-0.20 (-1.22, 0.82)
Wilcoxon signed-ranks test of difference: p-value				0.30703	0.34771
Normality test of difference: p-value				0.06375	0.13261
T-test of difference: p-value				0.48227	0.61152
Power of T-test to detect difference of 1/2 SD				97%	95%
Power of T-test to detect difference of 1 SD				100%	100%

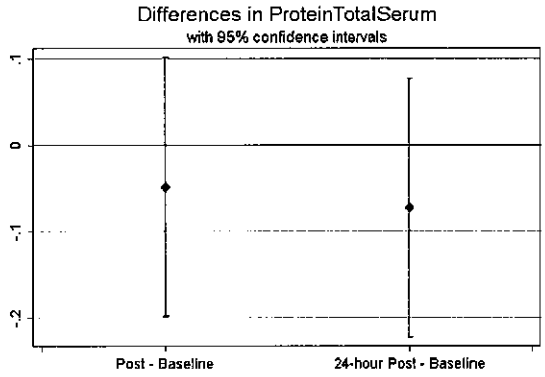


Protein Total Serum (g/dL)

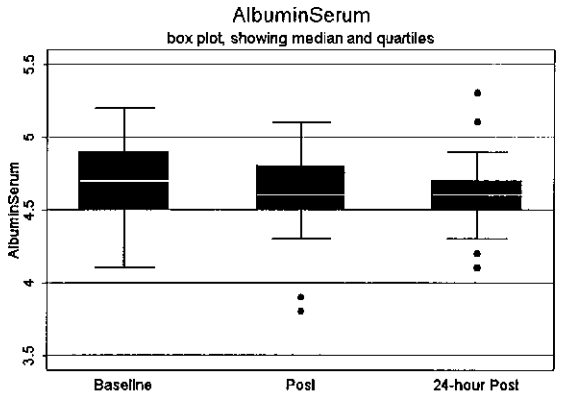


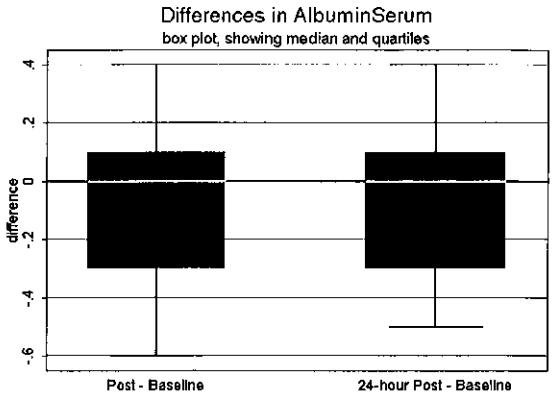


	Baseline	Post	24-Hour Post	Post - Baseline	24 Hour - Baseline
N	29	29	29	29	29
Mean	7.30	7.26	7.23	-0.05	-0.07
Median	7.30	7.30	7.10	0.00	-0.10
Standard dev.	0.38	0.35	0.43	0.40	0.40
Range	6.50-8.40	6.50-7.80	6.40-8.30	-1.00-0.80	-0.80-0.80
Change 95% Confidence interval				-0.05 (-0.20, 0.10)	-0.07 (-0.22, 0.08)
Percentage Change 95% Confidence interval				-0.50 (-2.56, 1.55)	-0.89 (-2.93, 1.15)
Wilcoxon signed-ranks test of difference: p-value				0.31252	0.09091
Normality test of difference: p-value				0.79867	0.32003
T-test of difference: p-value				0.51599	0.33248
Power of T-test to detect difference of 1/2 SD				73%	73%
Power of T-test to detect difference of 1 SD				100%	100%

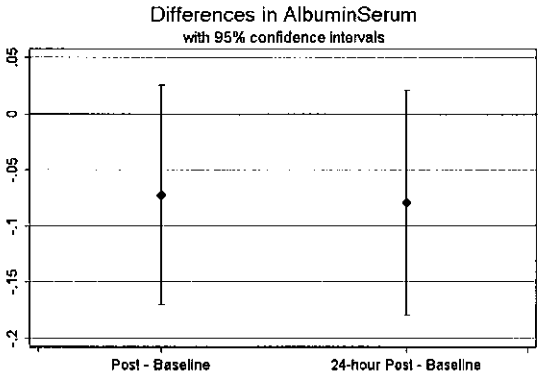


Albumin Serum (g/dL)

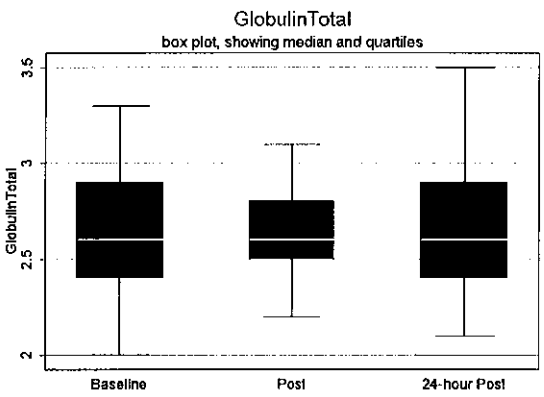


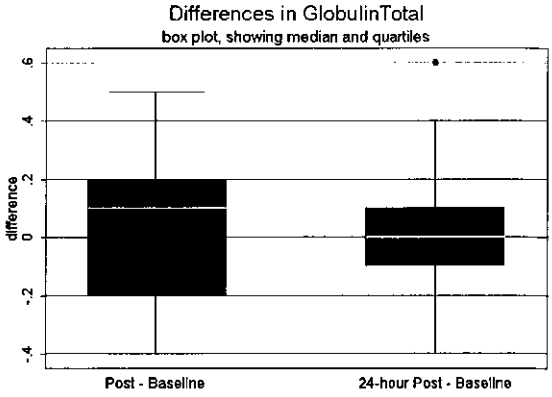


	Baseline	Post	24-Hour Post	Post - Baseline	24 Hour - Baseline
N	29	29	29	29	29
Mean	4.68	4.61	4.60	-0.07	-0.08
Median	4.70	4.60	4.60	0.00	0.00
Standard dev.	0.25	0.29	0.26	0.26	0.26
Range	4.10-5.20	3.80-5.10	4.10-5.30	-0.60-0.40	-0.50-0.40
Change 95% Confidence interval				-0.07 (-0.17, 0.03)	-0.08 (-0.18, 0.02)
Percentage Change 95% Confidence interval				-1.45 (-3.59, 0.69)	-1.55 (-3.70, 0.61)
Wilcoxon signed-ranks test of difference: p-value				0.10469	0.08439
Normality test of difference: p-value				0.90391	0.44819
T-test of difference: p-value				0.14127	0.11657
Power of T-test to detect difference of 1/2 SD				75%	73%
Power of T-test to detect difference of 1 SD				100%	100%

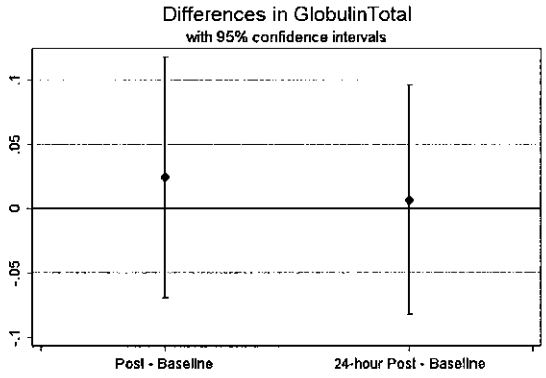


Globulin Total (g/dL)

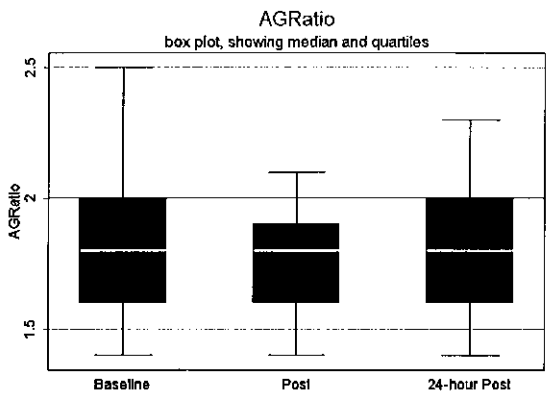


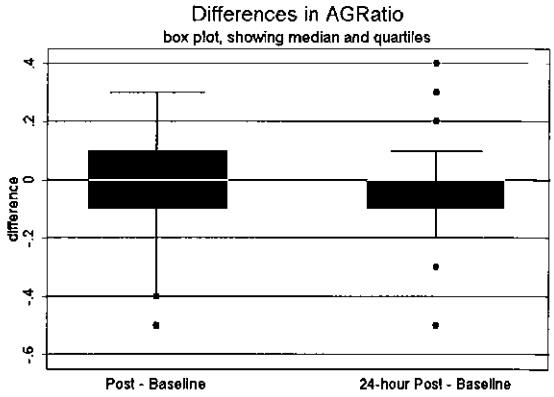


	Baseline	Post	24-Hour Post	Post - Baseline	24 Hour - Baseline
N	29	29	29	29	29
Mean	2.62	2.64	2.63	0.02	0.01
Median	2.60	2.60	2.60	0.10	0.00
Standard dev.	0.30	0.25	0.31	0.25	0.23
Range	2.00-3.30	2.20-3.10	2.10-3.50	-0.40-0.50	-0.40-0.60
Change 95% Confidence interval				0.02 (-0.07, 0.12)	0.01 (-0.08, 0.10)
Percentage Change 95% Confidence interval				1.57 (-2.12, 5.27)	0.66 (-2.83, 4.16)
Wilcoxon signed-ranks test of difference: p-value				0.32406	0.49133
Normality test of difference: p-value				0.90162	0.44255
T-test of difference: p-value				0.60124	0.87525
Power of T-test to detect difference of 1/2 SD				91%	94%
Power of T-test to detect difference of 1 SD				100%	100%

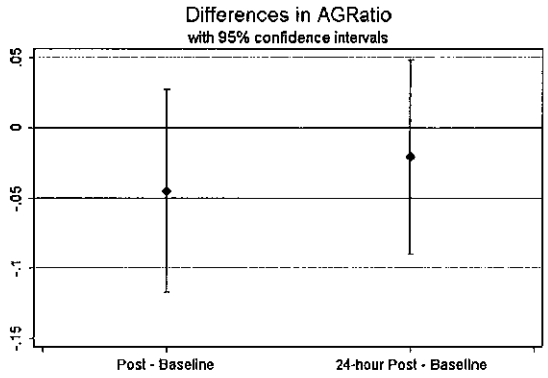


AG Ratio

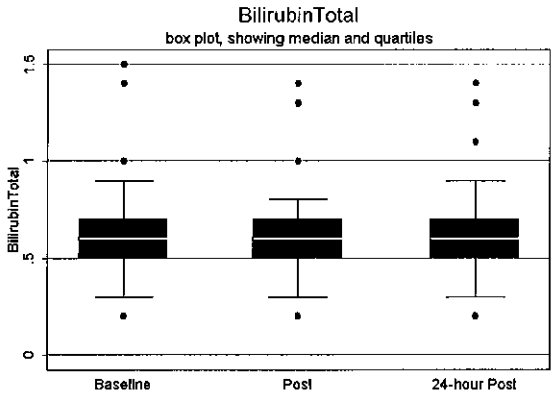


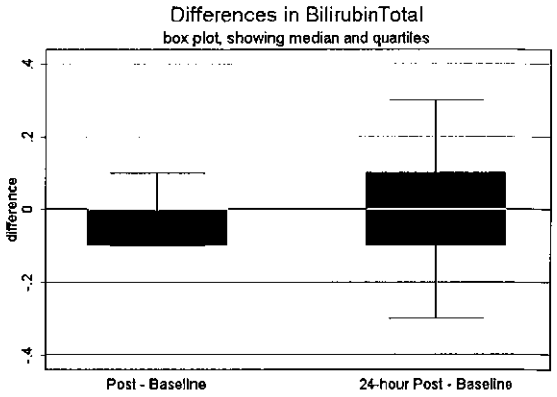


	Baseline	Post	24-Hour Post	Post - Baseline	24 Hour - Baseline
N	29	29	29	29	29
Mean	1.80	1.76	1.78	-0.04	-0.02
Median	1.80	1.80	1.80	0.00	0.00
Standard dev.	0.25	0.22	0.22	0.19	0.18
Range	1.40-2.50	1.40-2.10	1.40-2.30	-0.50-0.30	-0.50-0.40
Change 95% Confidence interval				-0.04 (-0.12, 0.03)	-0.02 (-0.09, 0.05)
Percentage Change 95% Confidence interval				-1.84 (-5.58, 1.91)	-0.52 (-4.22, 3.19)
Wilcoxon signed-ranks test of difference: p-value				0.15992	0.19342
Normality test of difference: p-value				0.44374	0.46067
T-test of difference: p-value				0.21455	0.54538
Power of T-test to detect difference of 1/2 SD				95%	96%
Power of T-test to detect difference of 1 SD				100%	100%

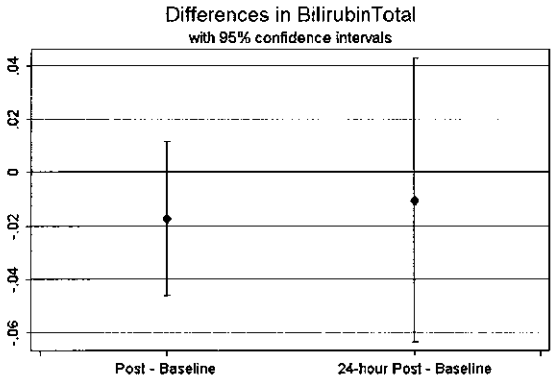


Bilirubin Total (mg/dL)

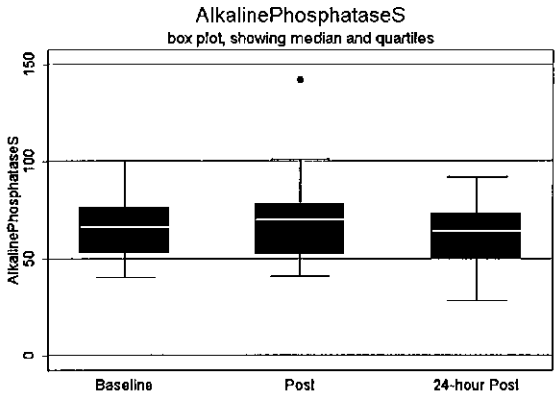


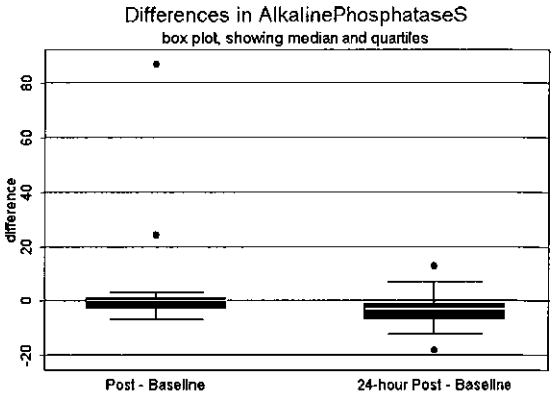


	Baseline	Post	24-Hour Post	Post - Baseline	24 Hour - Baseline
N	29	29	29	29	29
Mean	0.66	0.64	0.65	-0.02	-0.01
Median	0.60	0.60	0.60	0.00	0.00
Standard dev.	0.27	0.25	0.27	0.08	0.14
Range	0.20-1.50	0.20-1.40	0.20-1.40	-0.10-0.10	-0.30-0.30
Change 95% Confidence interval				-0.02 (-0.05, 0.01)	-0.01 (-0.06, 0.04)
Percentage Change 95% Confidence interval				-1.02 (-6.35, 4.30)	2.05 (-9.74, 13.83)
Wilcoxon signed-ranks test of difference: p-value				0.11555	0.25888
Normality test of difference: p-value				0.00045	0.62109
T-test of difference: p-value				0.23152	0.69320
Power of T-test to detect difference of 1/2 SD				100%	100%
Power of T-test to detect difference of 1 SD				100%	100%

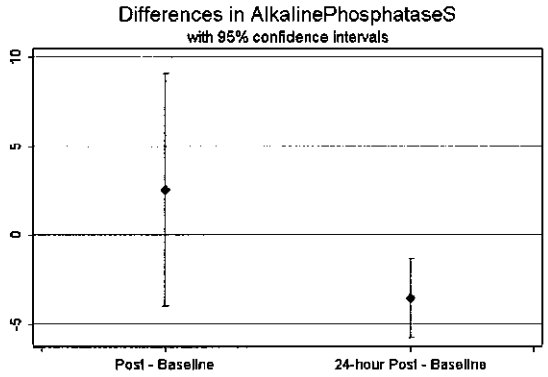


Alkaline Phosphatase (IU/L)

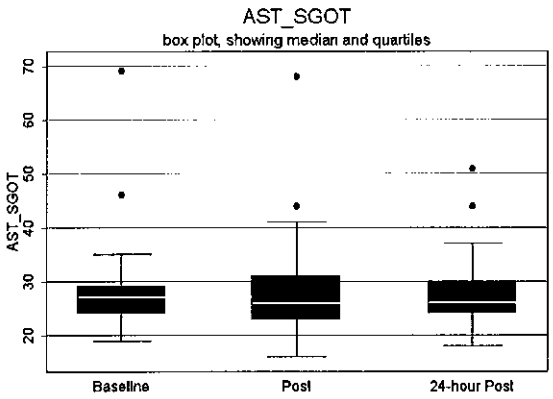


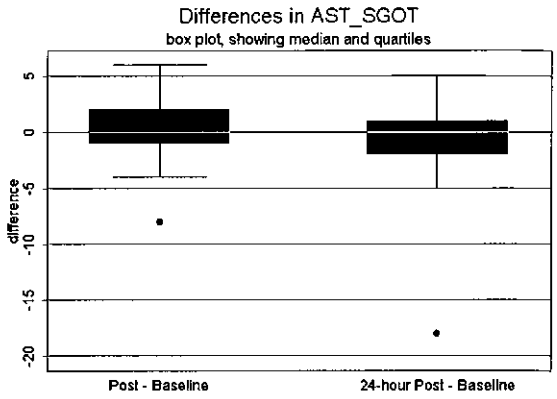


	Baseline	Post	24-Hour Post	Post - Baseline	24 Hour - Baseline
N	29	29	29	29	29
Mean	66.24	68.79	62.69	2.55	-3.55
Median	66.00	70.00	64.00	0.00	-3.00
Standard dev.	16.09	20.64	16.12	17.17	5.90
Range	40.00-100.00	41.00-142.00	28.00-92.00	-7.00-87.00	-18.00-13.00
Change 95% Confidence interval				2.55 (-3.98, 9.08)	-3.55 (-5.79, -1.31)
Percentage Change 95% Confidence interval				5.53 (-6.38, 17.44)	-5.41 (-8.93, -1.88)
Wilcoxon signed-ranks test of difference: p-value				0.14136	0.00042
Normality test of difference: p-value				0.00000	0.27334
T-test of difference: p-value				0.43039	0.00304
Power of T-test to detect difference of 1/2 SD				71%	
Power of T-test to detect difference of 1 SD				100%	

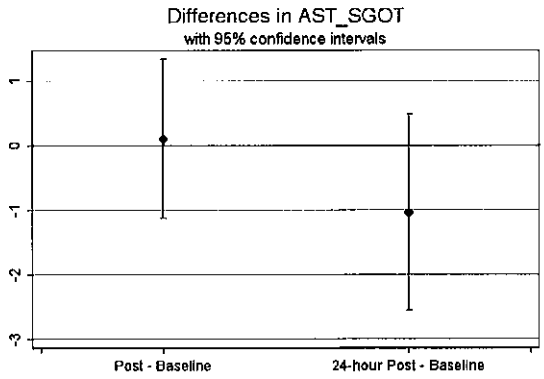


AST (SGOT) (IU/L)

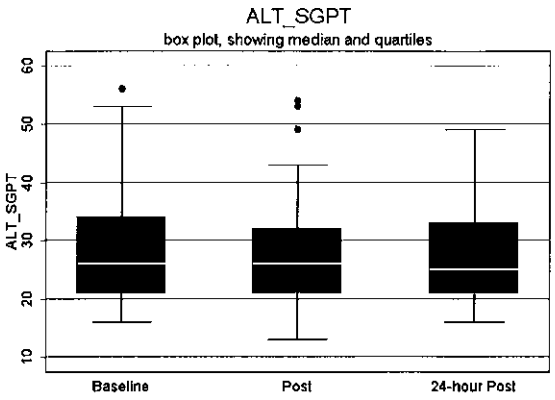


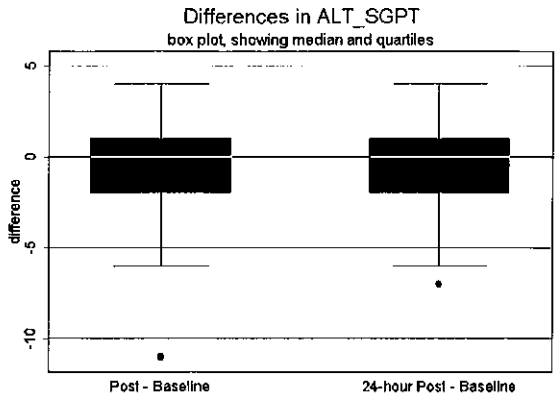


	Baseline	Post	24-Hour Post	Post - Baseline	24 Hour - Baseline
N	29	29	29	29	29
Mean	28.62	28.72	27.59	0.10	-1.03
Median	27.00	26.00	26.00	0.00	0.00
Standard dev.	9.42	9.68	7.02	3.24	4.00
Range	19.00-69.00	16.00-68.00	18.00-51.00	-8.00-6.00	-18.00-5.00
Change 95% Confidence interval				0.10 (-1.13, 1.34)	-1.03 (-2.55, 0.49)
Percentage Change 95% Confidence interval				0.70 (-4.04, 5.45)	-2.07 (-6.08, 1.94)
Wilcoxon signed-ranks test of difference: p-value				0.29663	0.12380
Normality test of difference: p-value				0.18892	0.00002
T-test of difference: p-value				0.86489	0.17419
Power of T-test to detect difference of 1/2 SD				100%	100%
Power of T-test to detect difference of 1 SD				100%	100%

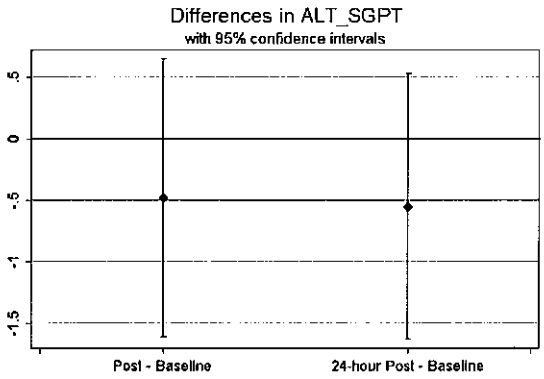


ALT (SGPT) (IU/L)

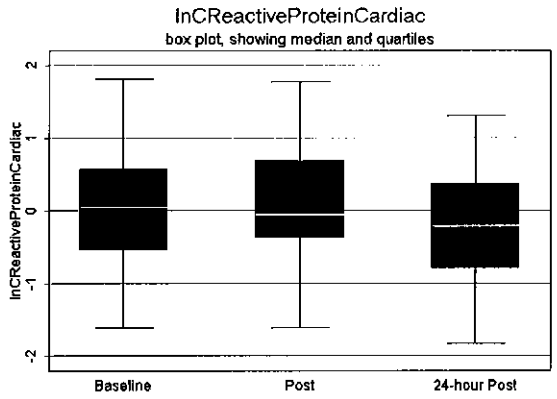


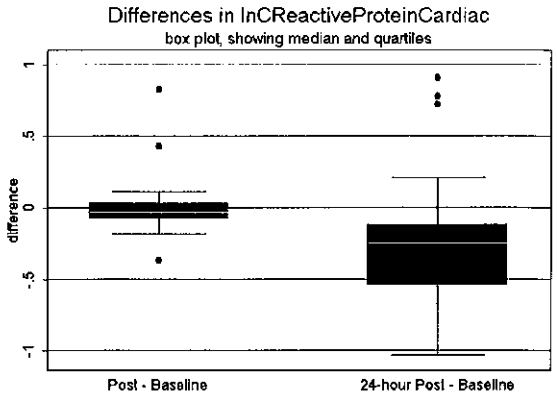


	Baseline	Post	24-Hour Post	Post - Baseline	24 Hour - Baseline
N	29	29	29	29	29
Mean	28.69	28.21	28.14	-0.48	-0.55
Median	26.00	26.00	25.00	0.00	0.00
Standard dev.	10.38	11.11	9.93	2.97	2.84
Range	16.00-56.00	13.00-54.00	16.00-49.00	-11.00-4.00	-7.00-4.00
Change 95% Confidence interval				-0.48 (-1.61, 0.65)	-0.55 (-1.63, 0.53)
Percentage Change 95% Confidence interval				-2.26 (-6.72, 2.21)	-1.57 (-4.85, 1.71)
Wilcoxon signed-ranks test of difference: p-value				0.29537	0.19599
Normality test of difference: p-value				0.00206	0.18762
T-test of difference: p-value				0.38908	0.30373
Power of T-test to detect difference of 1/2 SD				100%	100%
Power of T-test to detect difference of 1 SD				100%	100%

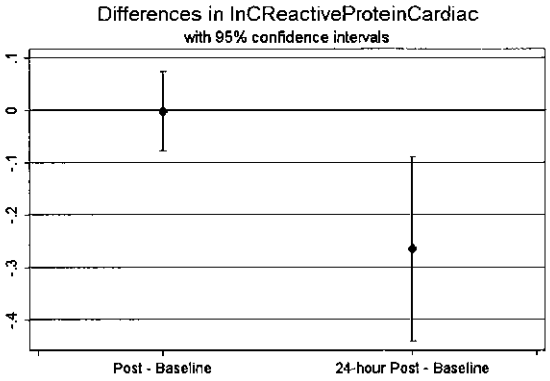


lnC-Reactive Protein Cardiac (ln(mg/L))

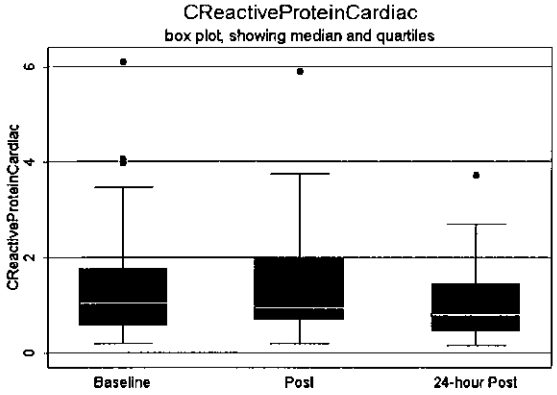


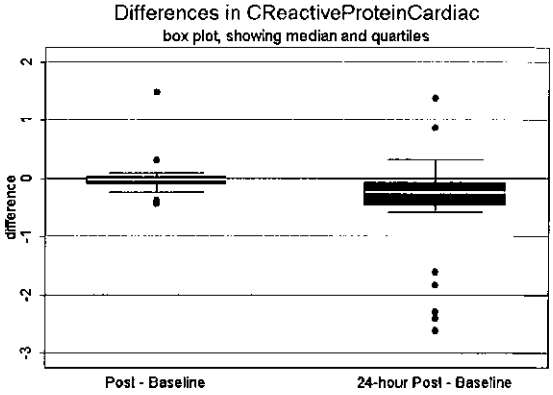


	Baseline	Post	24-Hour Post	Post - Baseline	24 Hour - Baseline
N	30	30	30	30	30
Mean	-0.02	-0.02	-0.28	0.00	-0.26
Median	0.04	-0.06	-0.22	-0.03	-0.25
Standard dev.	0.92	0.92	0.80	0.20	0.47
Range	-1.61-1.81	-1.61-1.77	-1.83-1.31	-0.37-0.83	-1.03-0.91
Change 95% Confidence interval				0.00 (-0.08, 0.07)	-0.26 (-0.44, -0.09)
Percentage Change 95% Confidence interval				-4.05 (-55.13, 47.03)	-121.07 (-326.84, 84.7)
Wilcoxon signed-ranks test of difference: p-value				0.04099	0.00121
Normality test of difference: p-value				0.00000	0.03223
T-test of difference: p-value				0.95140	0.00459
Power of T-test to detect difference of 1/2 SD				100%	
Power of T-test to detect difference of 1 SD				100%	



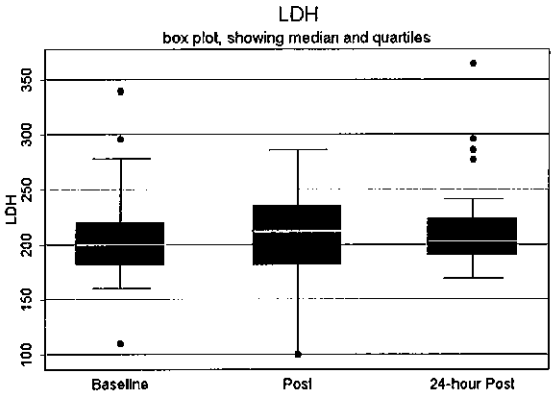
C-Reactive Protein Cardiac (mg/L)

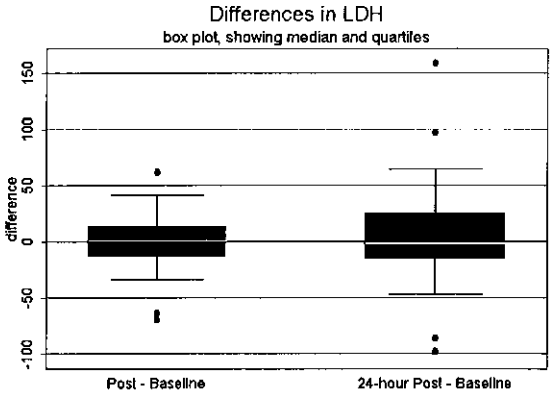




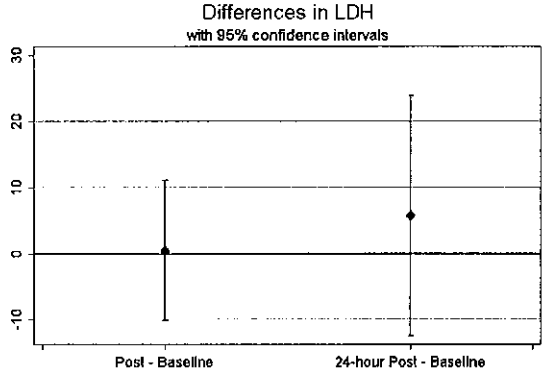
	Baseline	Post	24-Hour Post	Post - Baseline	24 Hour - Baseline
Mean	1.45	1.44	1.01	-0.01	-0.44
Median	1.04	0.94	0.81	-0.03	-0.25
Standard dev.	1.37	1.32	0.79	0.31	0.88
Range	0.20-6.10	0.20-5.89	0.16-3.70	-0.44-1.47	-2.61-1.38
Mean	1.45	1.44	1.01	-0.01	-0.44

LDH (IU/L)

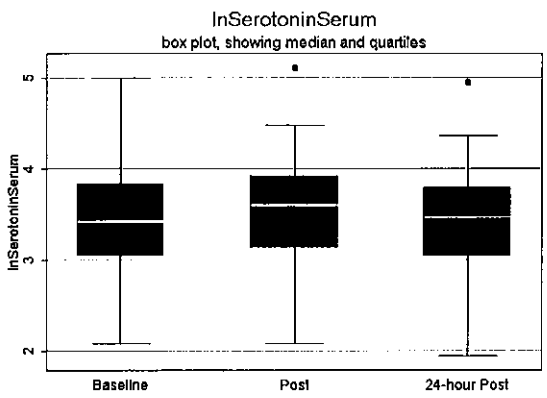


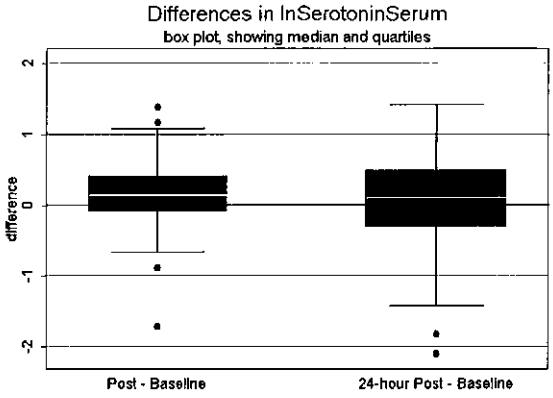


	Baseline	Post	24-Hour Post	Post - Baseline	24 Hour – Baseline
N	30	30	30	30	30
Mean	209.00	209.40	214.70	0.40	5.70
Median	200.00	211.50	202.50	0.50	-1.50
Standard dev.	44.55	39.61	42.49	28.53	48.55
Range	110-339	100-286	169-364	-70.00-62.00	-98.00-159.00
Change 95% Confidence interval				0.40 (-10.25, 11.05)	5.70 (-12.43, 23.83)
Percentage Change 95% Confidence interval				1.23 (-3.82, 6.28)	5.58 (-3.37, 14.54)
Wilcoxon signed-ranks test of difference: p-value				0.45903	0.32172
Normality test of difference: p-value				0.33064	0.03149
T-test of difference: p-value				0.93932	0.52527
Power of T-test to detect difference of 1/2 SD				99%	71%
Power of T-test to detect difference of 1 SD				100%	100%

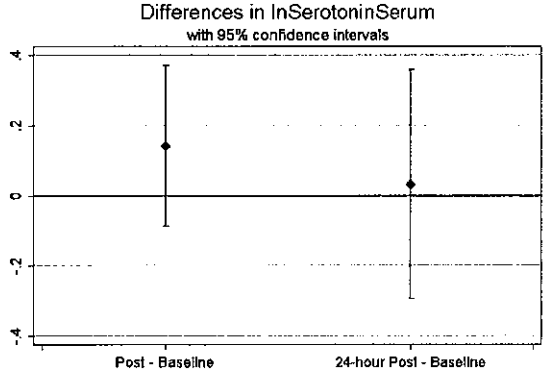


lnSerotonin Serum (ln(ng/mL))

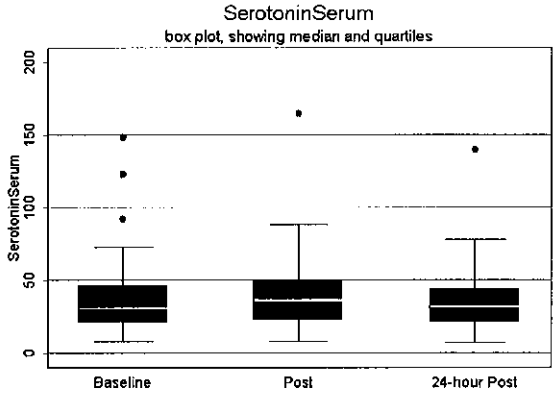


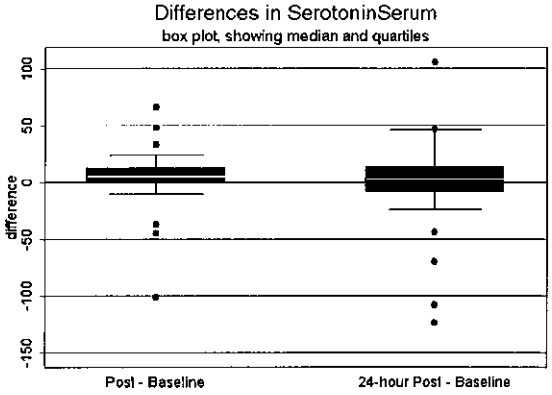


	Baseline	Post	24-Hour Post	Post - Baseline	24 Hour - Baseline
N	30	30	30	30	30
Mean	3.41	3.55	3.44	0.14	0.03
Median	3.42	3.60	3.46	0.13	0.10
Standard dev.	0.72	0.64	0.65	0.61	0.88
Range	2.08-5.00	2.08-5.11	1.95-4.94	-1.72-1.39	-2.10-1.42
Change 95% Confidence interval				0.14 (-0.09, 0.37)	0.03 (-0.30, 0.36)
Percentage Change 95% Confidence interval				6.15 (-0.52, 12.83)	4.28 (-4.88, 13.44)
Wilcoxon signed-ranks test of difference: p-value				0.02919	0.22945
Normality test of difference: p-value				0.06997	0.08403
T-test of difference: p-value				0.21417	0.84490
Power of T-test to detect difference of 1/2 SD				90%	62%
Power of T-test to detect difference of 1 SD				100%	99%



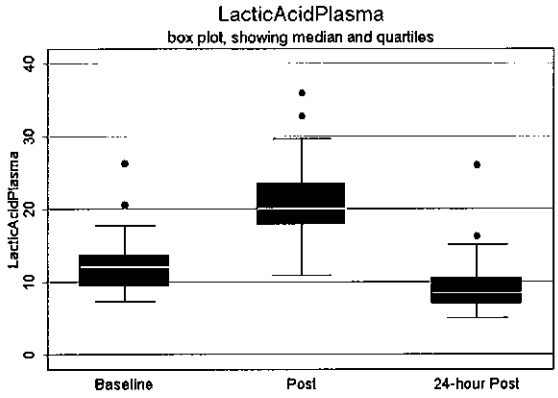
Serotonin Serum (ng/mL)

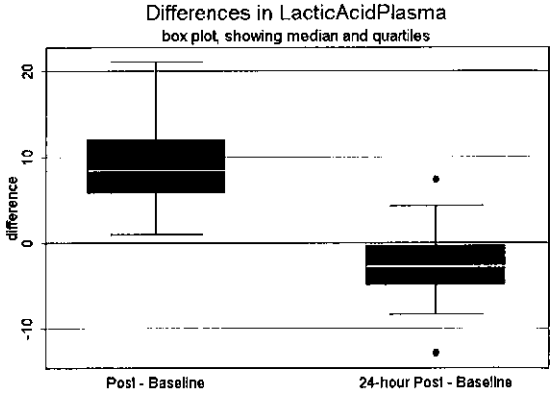




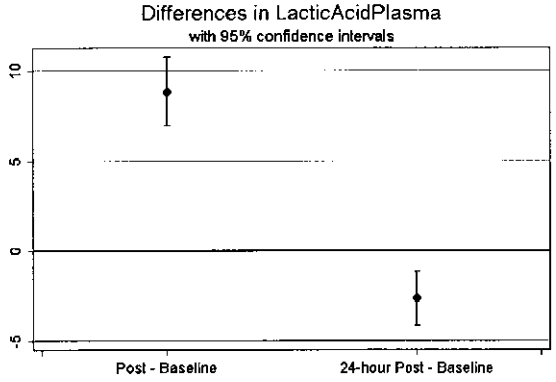
	Baseline	Post	24-Hour Post	Post - Baseline	24 Hour - Baseline
N	30	30	30	30	30
Mean	39.30	42.43	38.40	3.13	-0.90
Median	30.50	36.50	32.00	5.00	2.50
Standard dev.	32.56	30.17	27.64	28.41	43.67
Range	8-148	8-165	7-140	-101.00-66.00	-124.00-106.00

Lactic Acid Plasma (mg/dL)

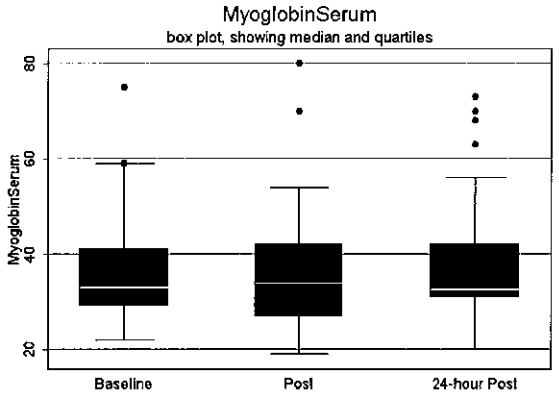


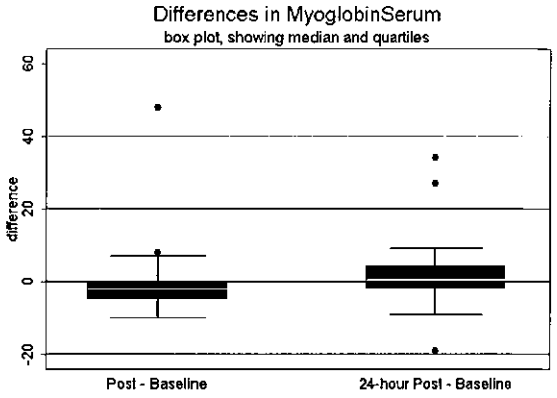


	Baseline	Post	24-Hour Post	Post - Baseline	24 Hour - Baseline
N	30	30	30	30	30
Mean	12.27	21.13	9.64	8.86	-2.63
Median	12.05	20.00	8.40	8.40	-2.75
Standard dev.	4.04	5.84	4.21	5.10	4.03
Range	7.30-26.30	10.90-35.90	5.00-26.00	0.90-21.10	-12.90-7.40
Change 95% Confidence interval				8.86 (6.96, 10.77)	-2.63 (-4.14, -1.13)
Percentage Change 95% Confidence interval				80.19 (60.27, 100.10)	-18.45 (-30.04, -6.85)
Wilcoxon signed-ranks test of difference: p-value				0.00000	0.00058
Normality test of difference: p-value				0.14161	0.94778
T-test of difference: p-value				0.00000	0.00123

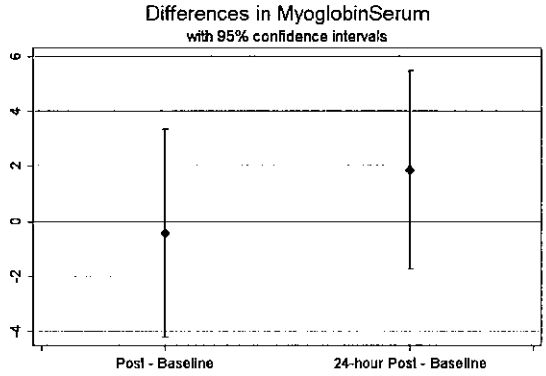


Myoglobin Serum (ng/mL)

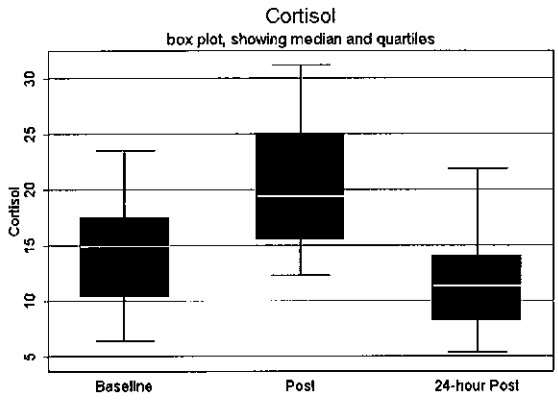


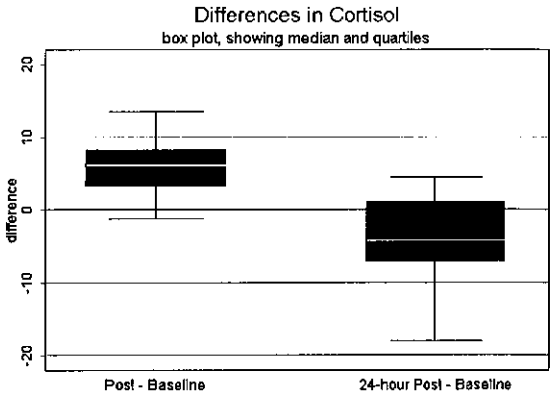


	Baseline	Post	24-Hour Post	Post - Baseline	24 Hour - Baseline
N	30	30	30	30	30
Mean	36.27	35.83	38.13	-0.43	1.87
Median	33.00	34.00	32.50	-2.00	0.50
Standard dev.	11.67	13.48	14.06	10.13	9.69
Range	22.00-75.00	19.00-80.00	20.00-73.00	-10.00-48.00	-19.00-34.00
Change 95% Confidence interval				-0.43 (-4.22, 3.35)	1.87 (-1.75, 5.48)
Percentage Change 95% Confidence interval				0.31 (-11.31, 11.94)	6.69 (-3.53, 16.90)
Wilcoxon signed-ranks test of difference: p-value				0.02335	0.15776
Normality test of difference: p-value				0.00000	0.00035
T-test of difference: p-value				0.81638	0.29995
Power of T-test to detect difference of 1/2 SD				88%	91%
Power of T-test to detect difference of 1 SD				100%	100%

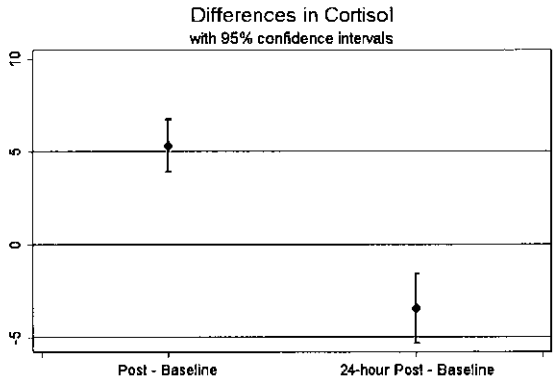


Cortisol (ug/dL)

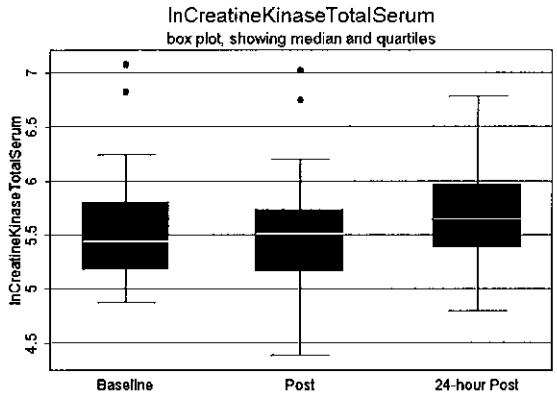


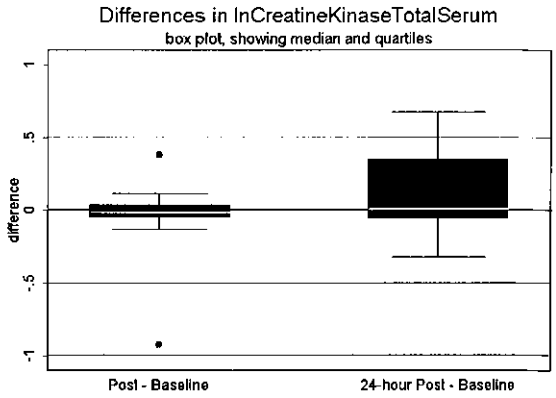


	Baseline	Post	24-Hour Post	Post - Baseline	24 Hour - Baseline
N	30	30	30	30	30
Mean	14.78	20.12	11.36	5.33	-3.43
Median	14.90	19.40	11.35	6.15	-4.15
Standard dev.	4.79	5.45	3.97	3.78	5.00
Range	6.40-23.50	12.30-31.20	5.40-21.90	-1.30-13.50	-18.00-4.40
Change 95% Confidence interval				5.33 (3.92, 6.74)	-3.43 (-5.29, -1.56)
Percentage Change 95% Confidence interval				43.32 (29.55, 57.09)	-18.35 (-29.09, -7.62)
Wilcoxon signed-ranks test of difference: p-value				0.00000	0.00069
Normality test of difference: p-value				0.39960	0.16715
T-test of difference: p-value				0.00000	0.00078

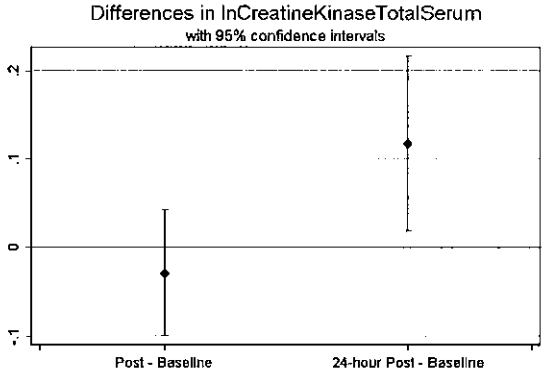


lnCreatine Kinase Total Serum (ln(U/L))

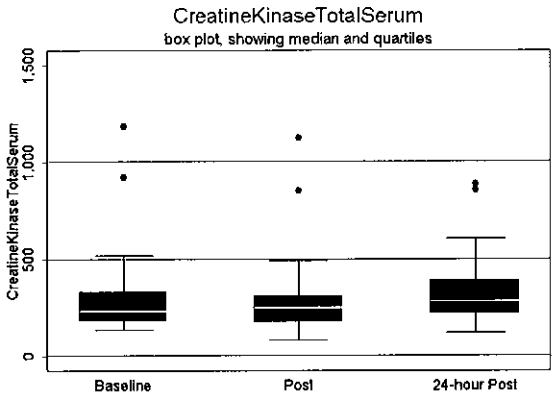


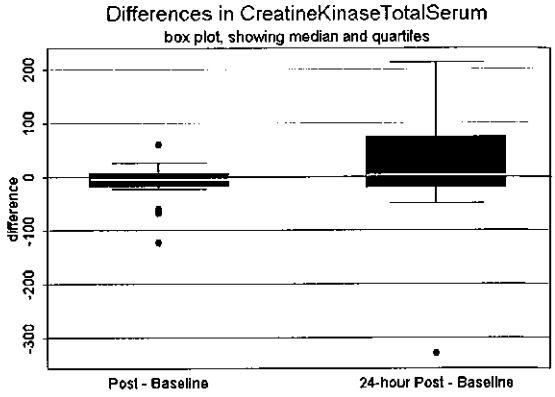


	Baseline	Post	24-Hour Post	Post - Baseline	24 Hour - Baseline
N	30	30	30	30	30
Mean	5.57	5.54	5.68	-0.03	0.12
Median	5.44	5.51	5.65	-0.02	0.01
Standard dev.	0.53	0.55	0.48	0.19	0.26
Range	4.88-7.08	4.38-7.02	4.80-6.79	-0.93-0.38	-0.33-0.67
Change 95% Confidence interval				-0.03 (-0.10, 0.04)	0.12 (0.02, 0.22)
Percentage Change 95% Confidence interval				-0.50 (-1.86, 0.86)	2.30 (0.46, 4.14)
Wilcoxon signed-ranks test of difference: p-value				0.12682	0.05320
Normality test of difference: p-value				0.00000	0.04885
T-test of difference: p-value				0.41567	0.02150
Power of T-test to detect difference of 1/2 SD				100%	
Power of T-test to detect difference of 1 SD				100%	



Creatine Kinase Total Serum (U/L)





	Baseline	Post	24-Hour Post	Post - Baseline	24 Hour - Baseline
N	30	30	30	30	30
Mean	307.93	299.87	330.77	-8.07	22.83
Median	230.50	247.00	284.00	-4.00	3.00
Standard dev.	228.91	215.63	183.59	31.74	95.23
Range	131-1184	80-1124	121-885	-122.00-61.00	-329.00-213.00